

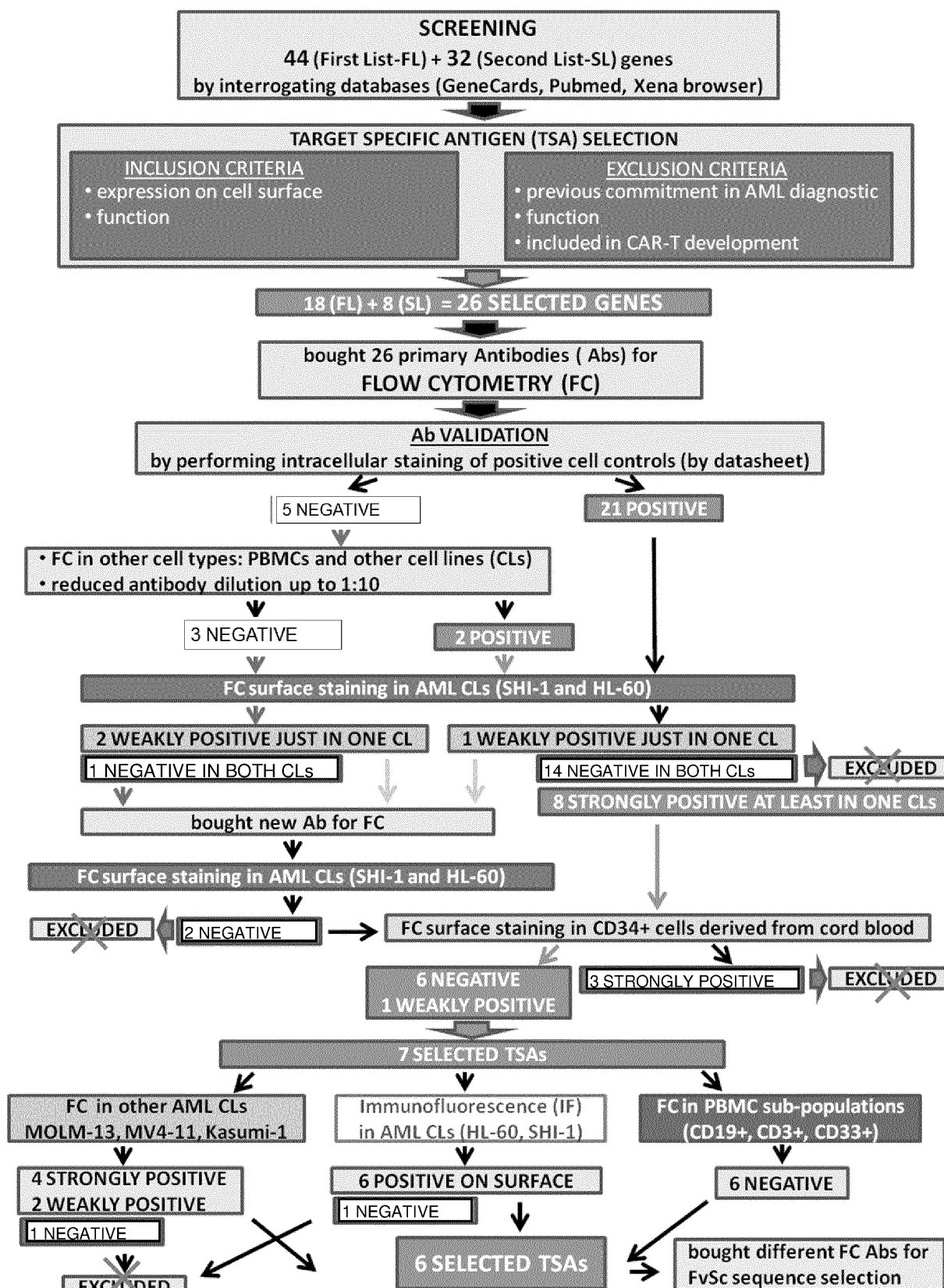


FIG. 1

SUBSTITUTE SHEET (RULE 26)

FIG. 2A

AML Cell Lines

Ab CD69 (Invitrogen 14-0699-82)

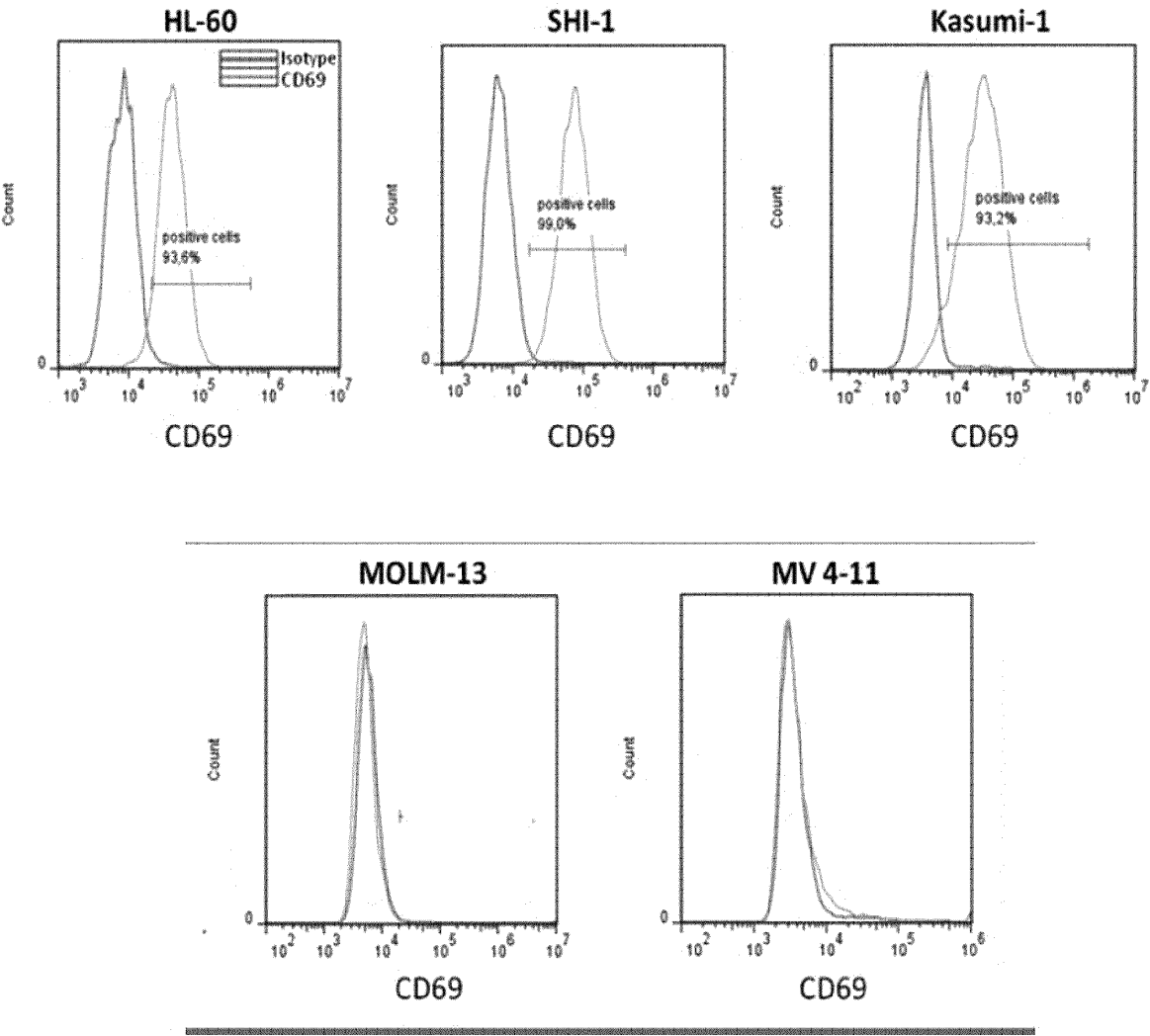


FIG. 2A (cont'd)

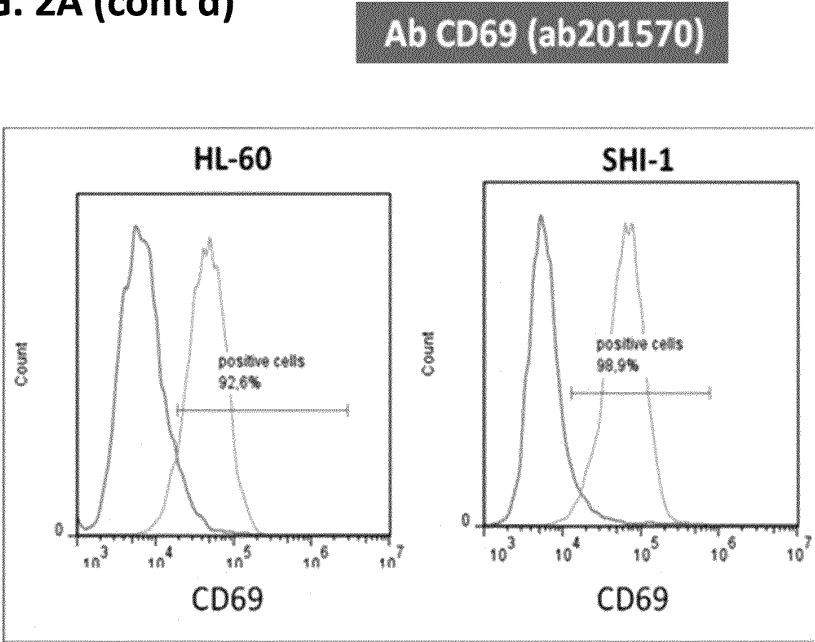


FIG. 2B

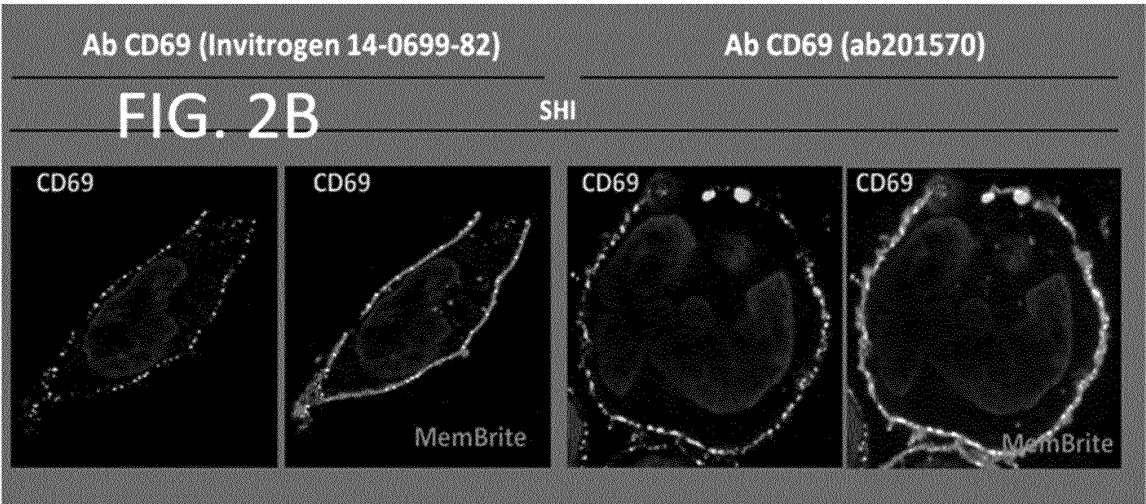
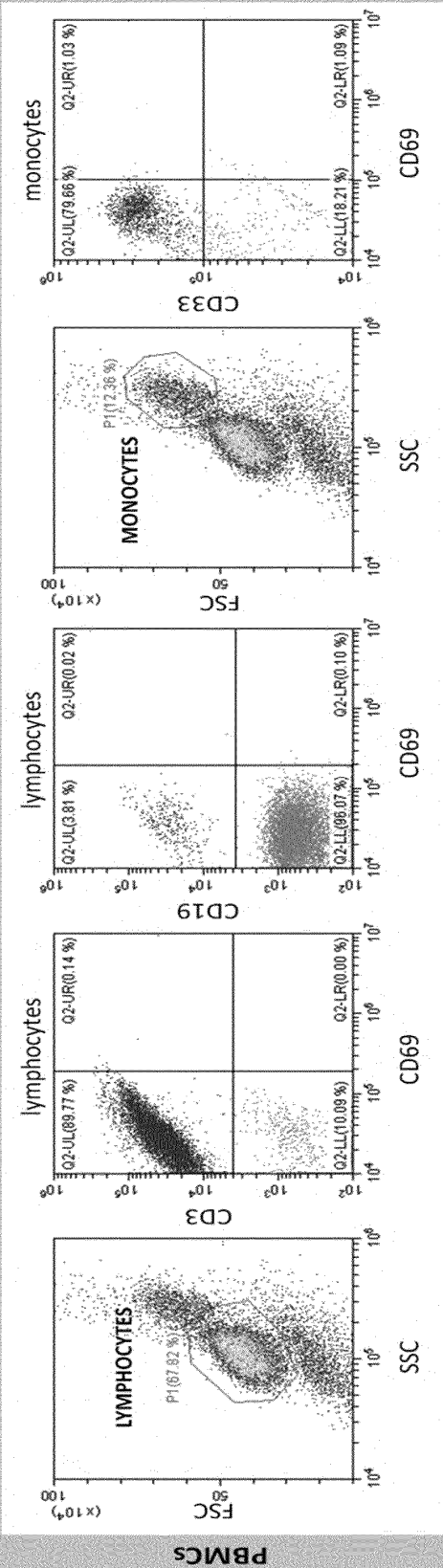


FIG. 2C

HEALTHY HEMATOPOIETIC CELLS

Ab CD69 (Invitrogen 14-0699-82)



Ab CD69 (Invitrogen14-0699-82) Ab CD69 (R&D MAB2359)

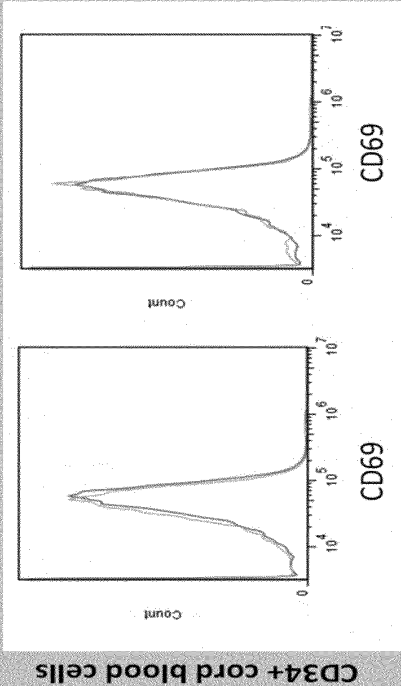


FIG. 3A

AML Cell Lines

Ab CD63 (ab59479)

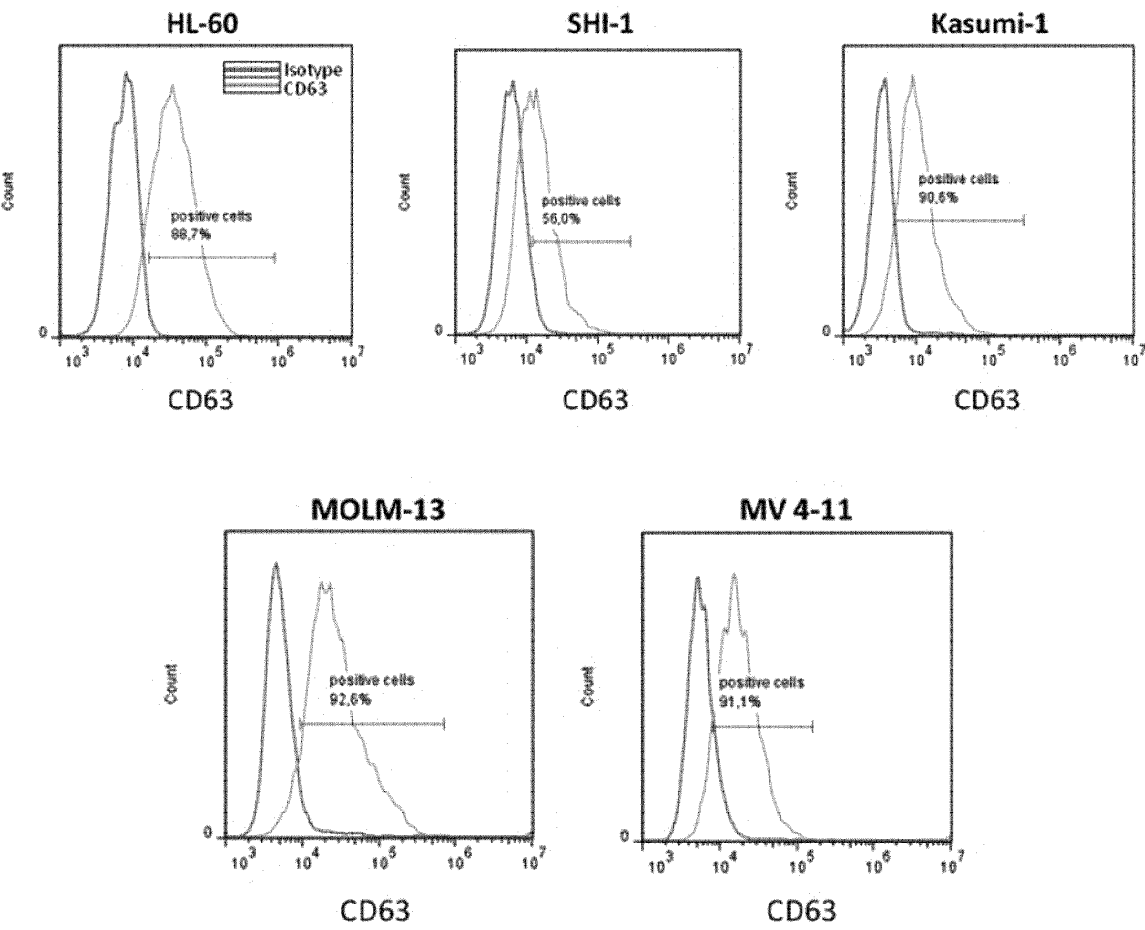


FIG. 3A (cont'd)

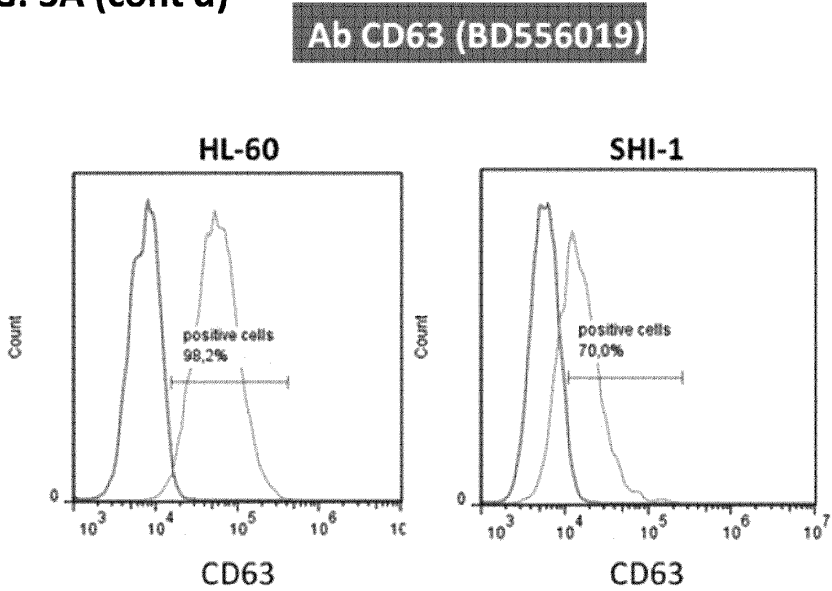


FIG. 3B

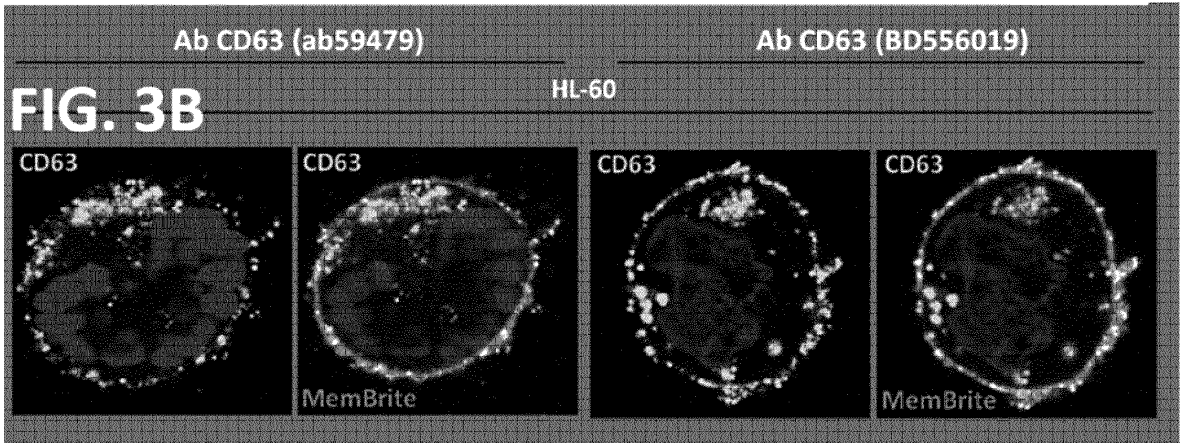


FIG. 3C

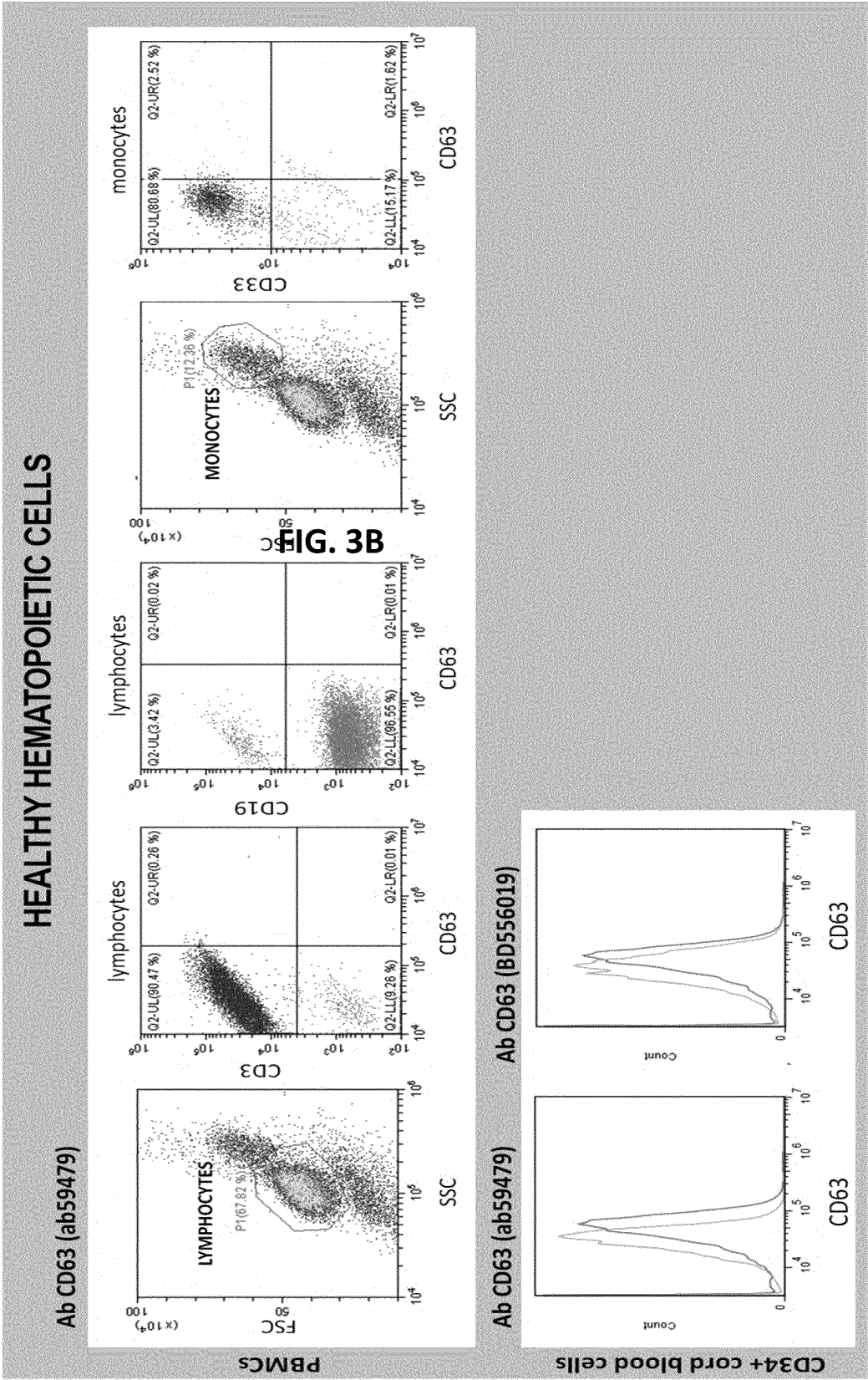


FIG. 4A

AML Cell Lines

Ab CD151 (Invitrogen MA5-16443)

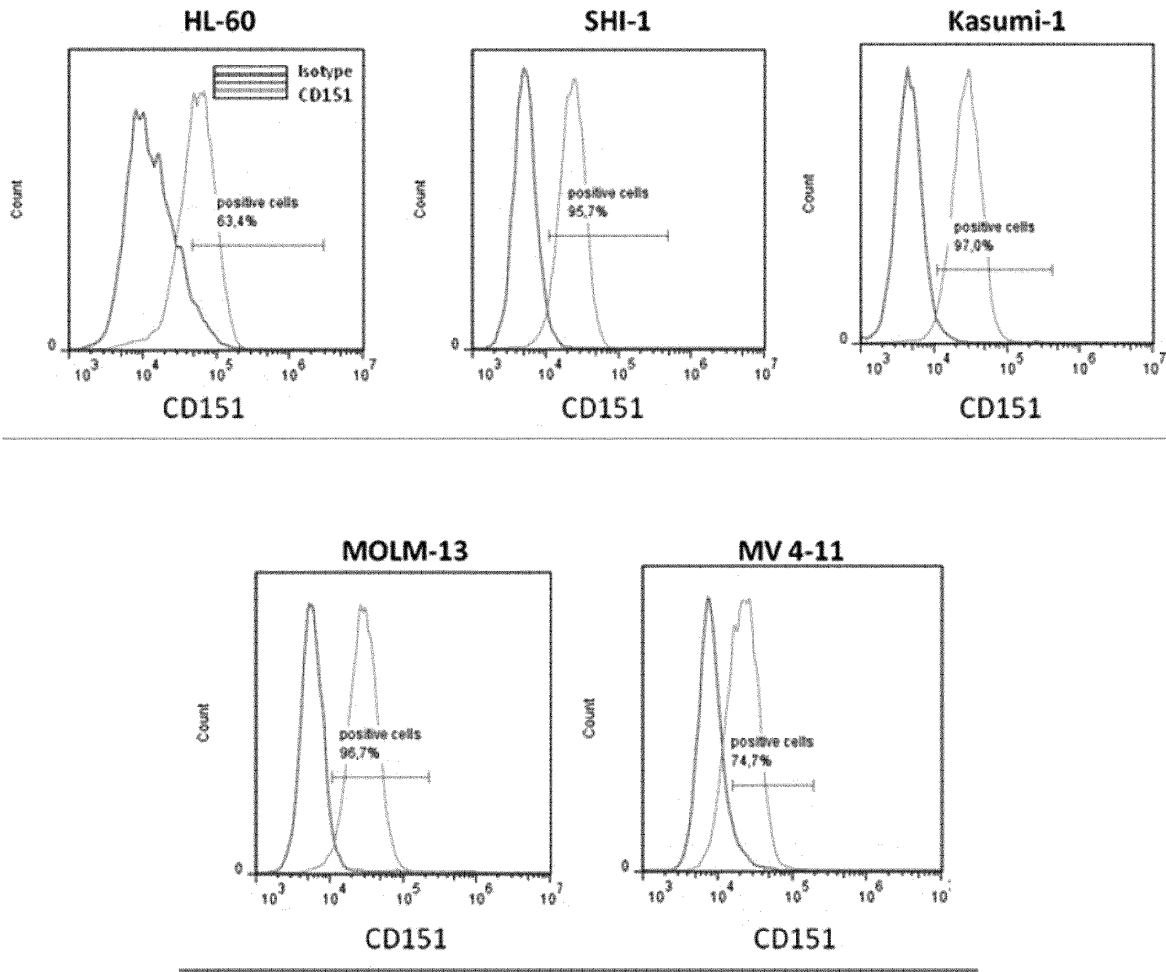


FIG. 4A (cont'd)

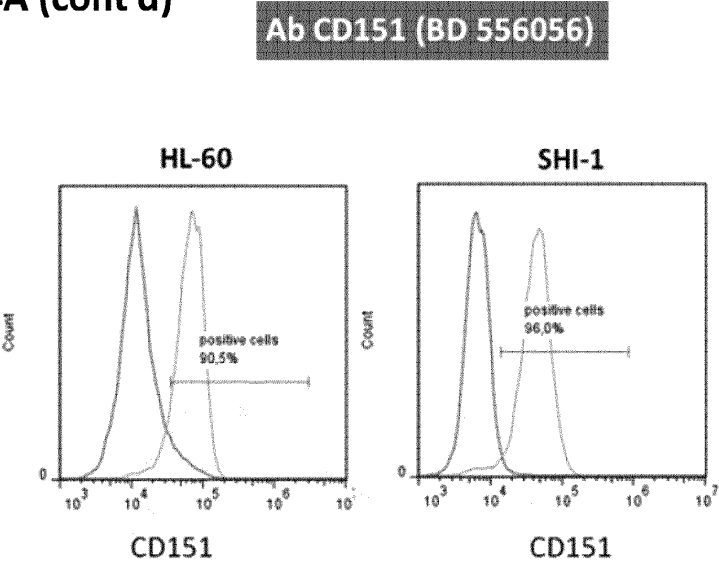


FIG. 4B

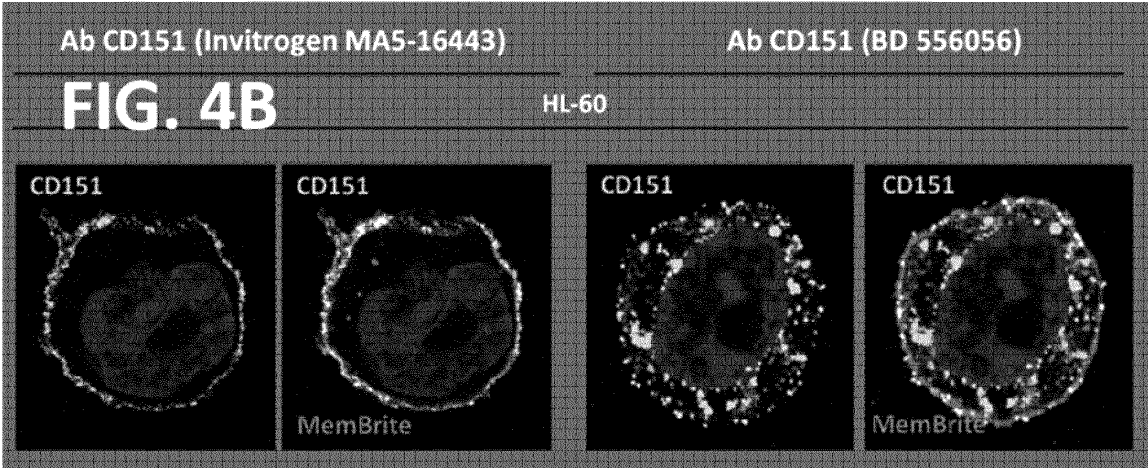
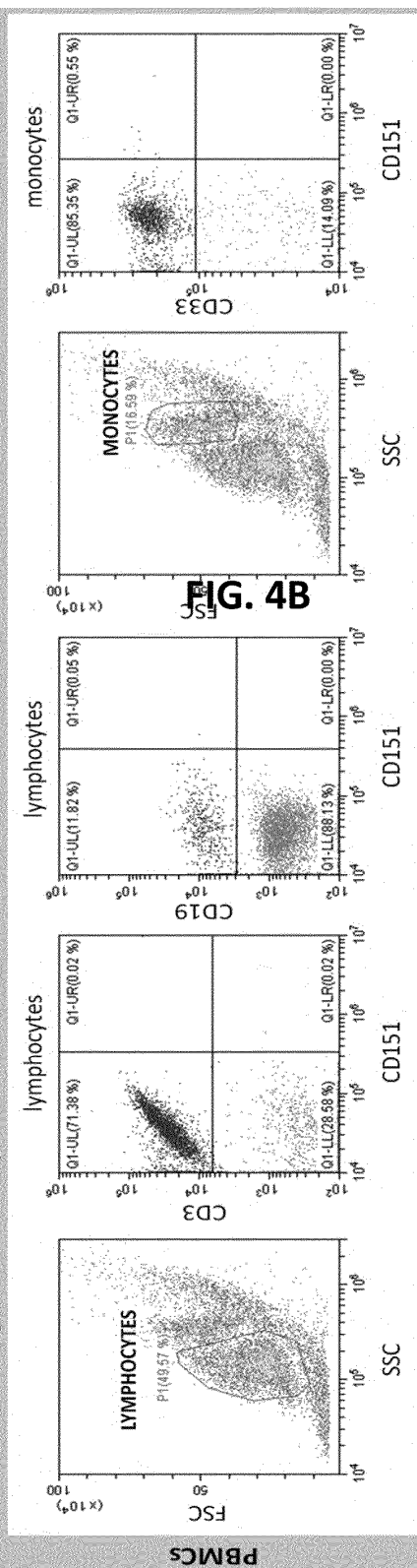


FIG. 4C

HEALTHY HEMATOPOIETIC CELLS

Ab CD151 (Invitrogen MA5-16443)



Ab CD151 (Invitrogen MA5-16443) Ab CD151 (BD556056)

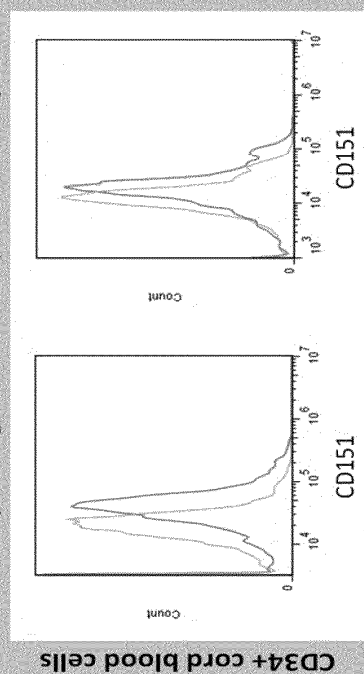


FIG. 5A

AML Cell Lines

Ab CD84 (Biolegend 326002)

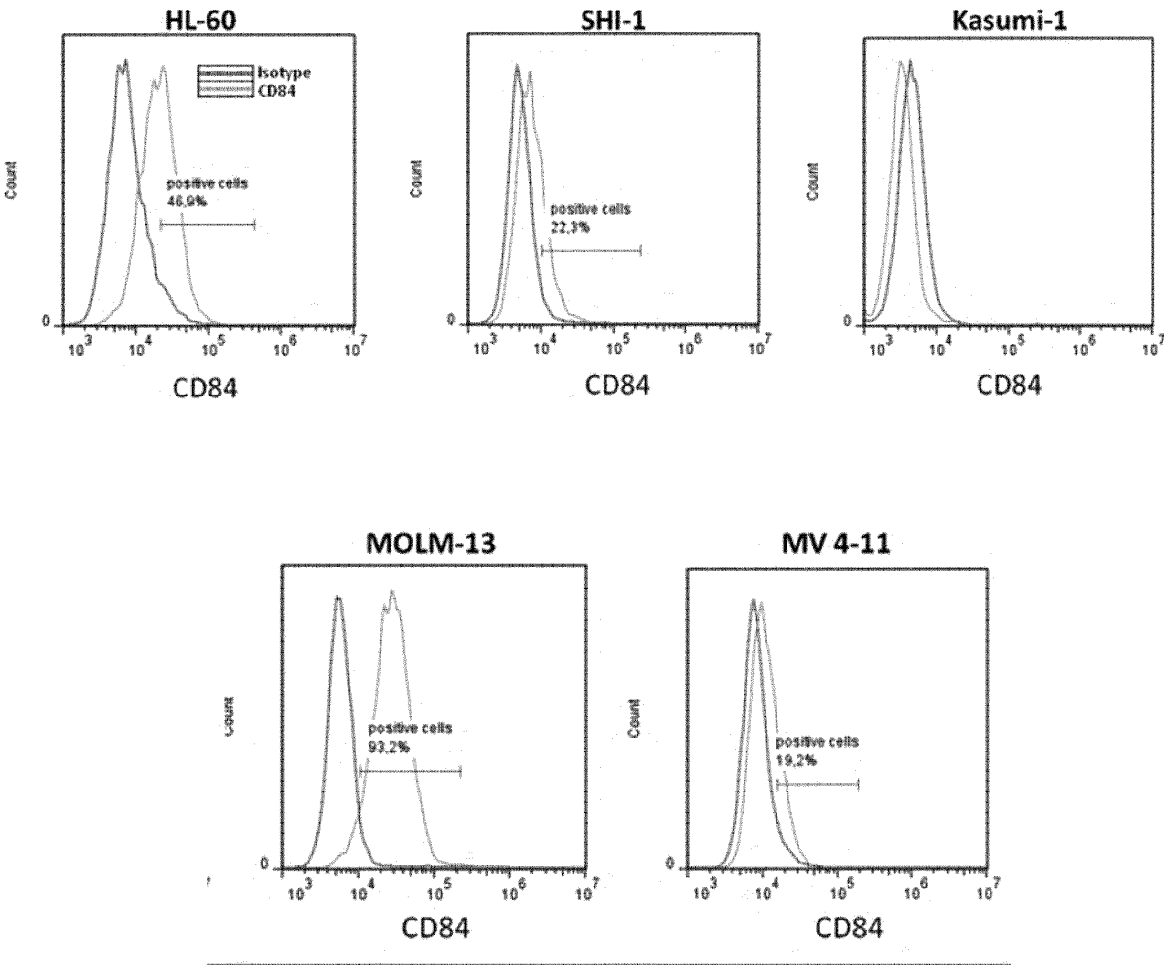


FIG. 5A (cont'd)

Ab CD84 (NOVUS NBP2-44345)

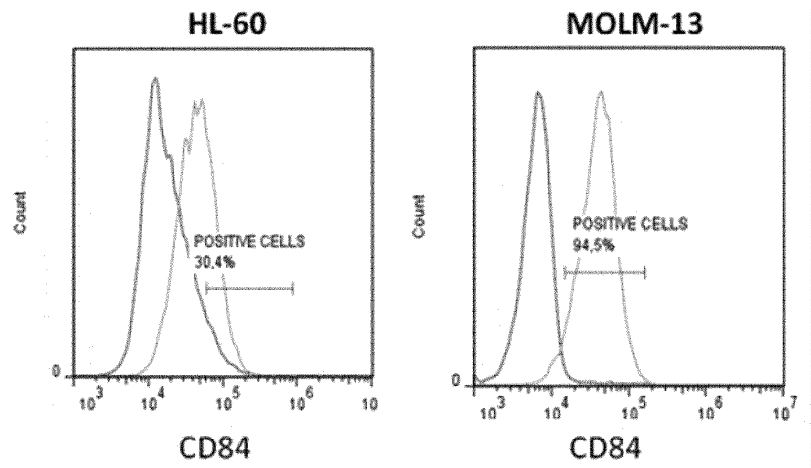


FIG. 5B

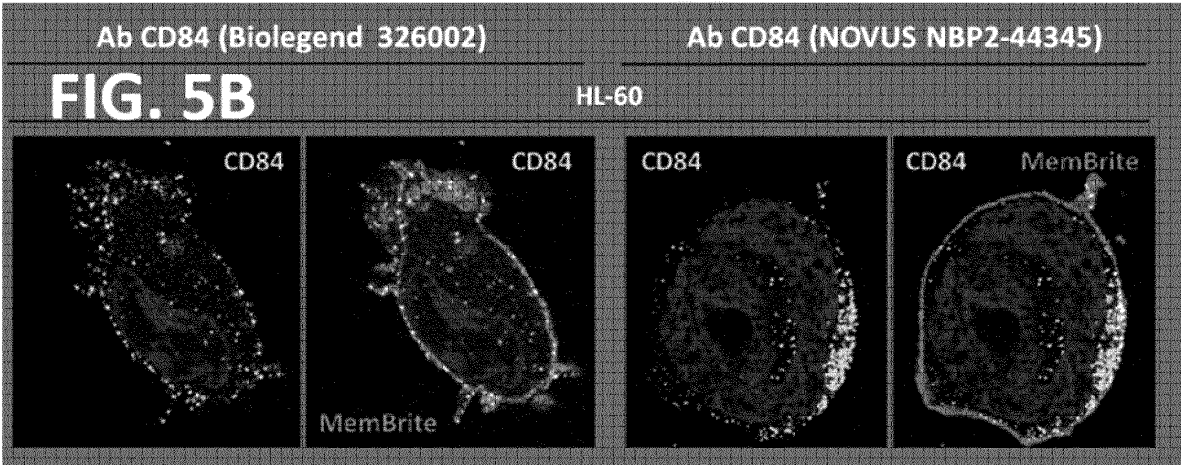
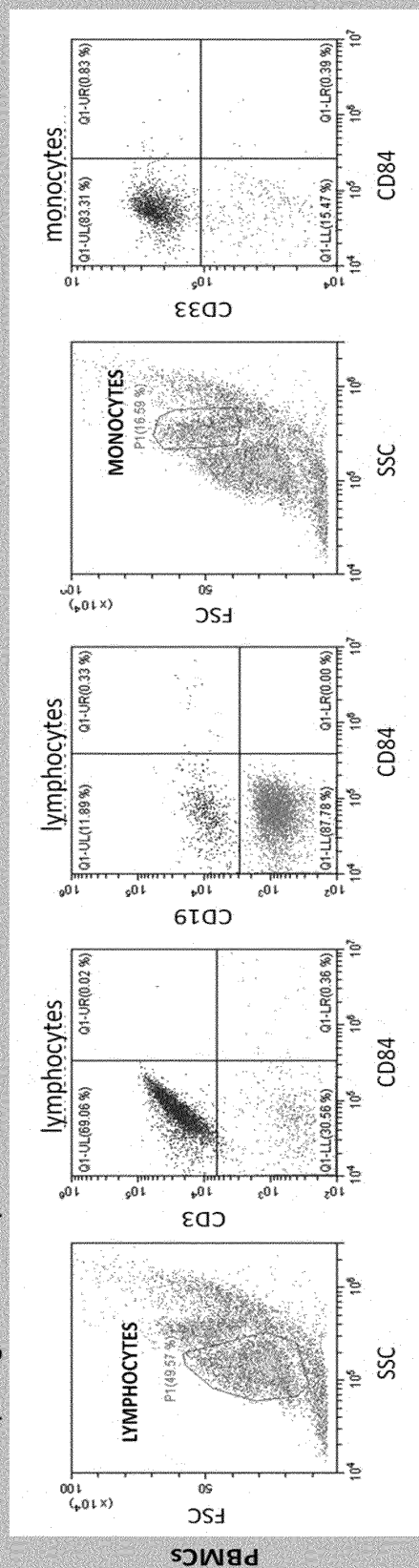


FIG. 5C

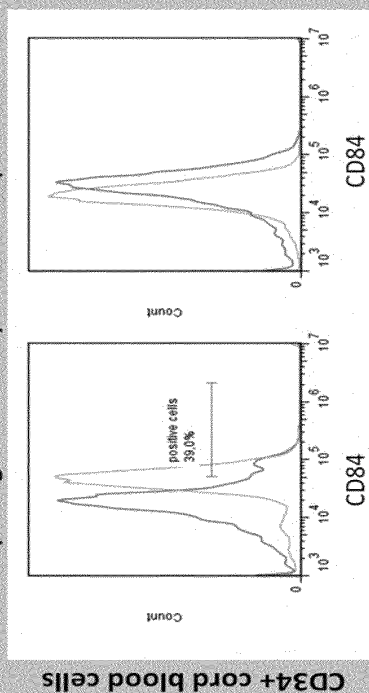
HEALTHY HEMATOPOIETIC CELLS

Ab CD84 (Biolegend 326002)



Ab CD84 (Biolegend 326002)

Ab CD84 (NOVUS NBP2-44345)



CD34+ cord blood cells

FIG. 6A

AML Cell Lines

Ab CD109 (R&D MAB4385)

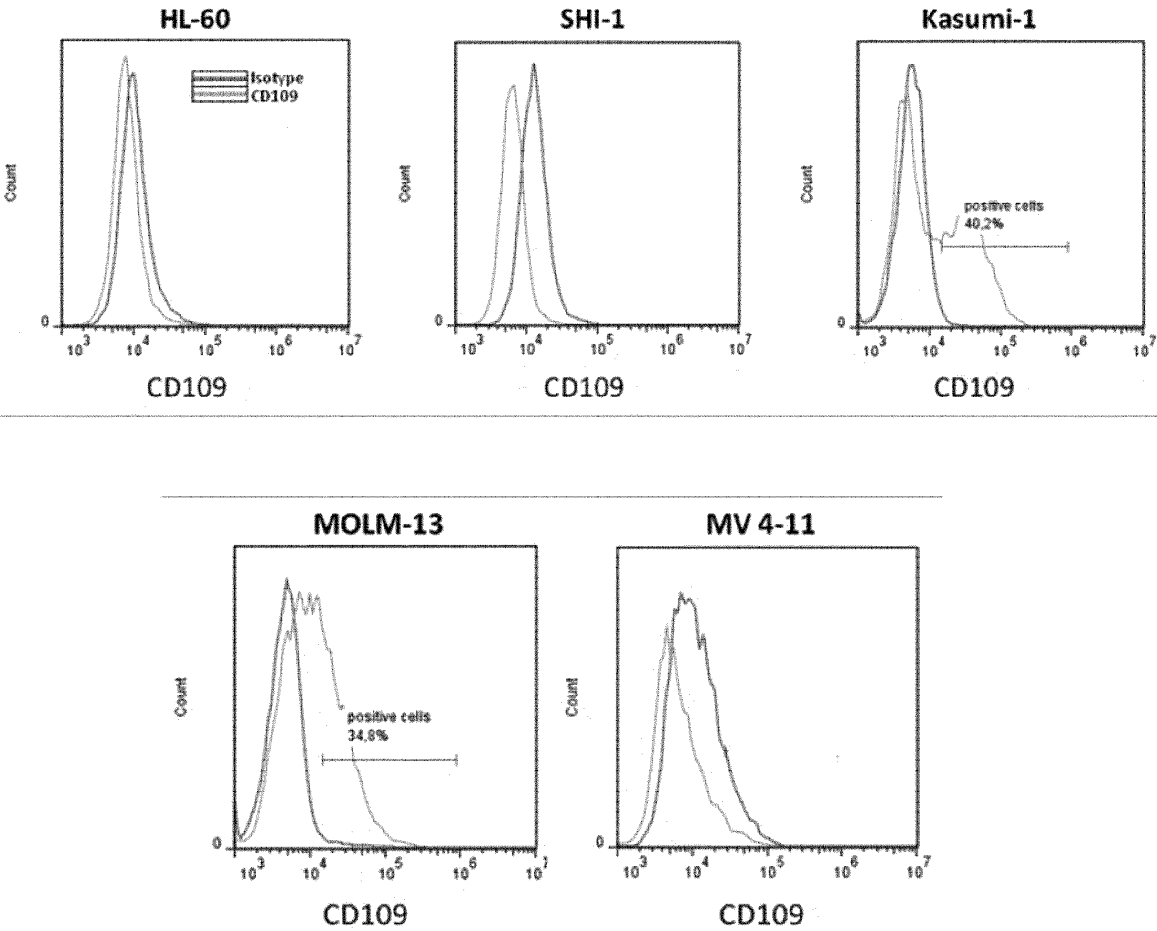


FIG. 6A (cont'd)

Ab CD109 (BD556039)

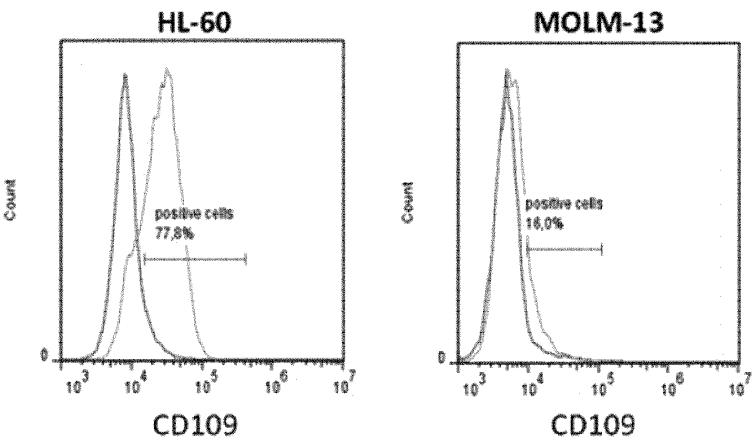


FIG. 6B

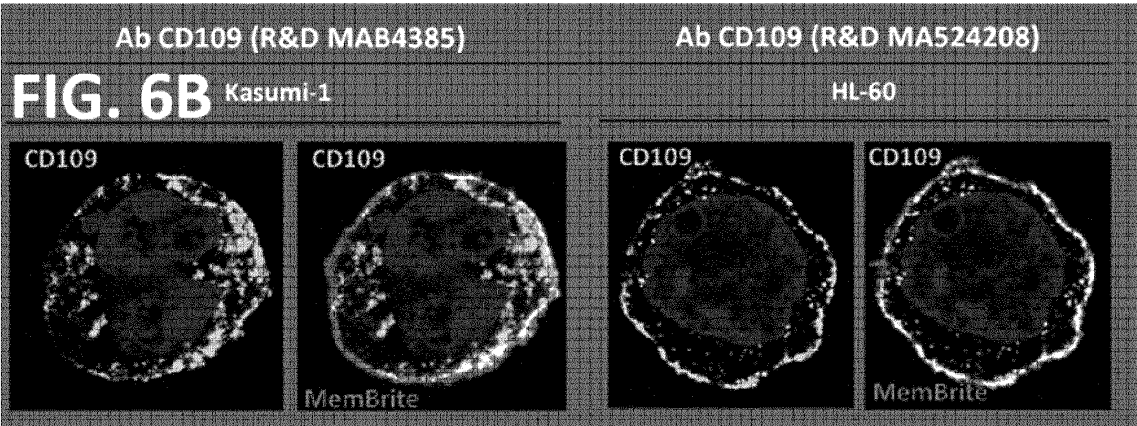


FIG. 6C

HEALTHY HEMATOPOIETIC CELLS

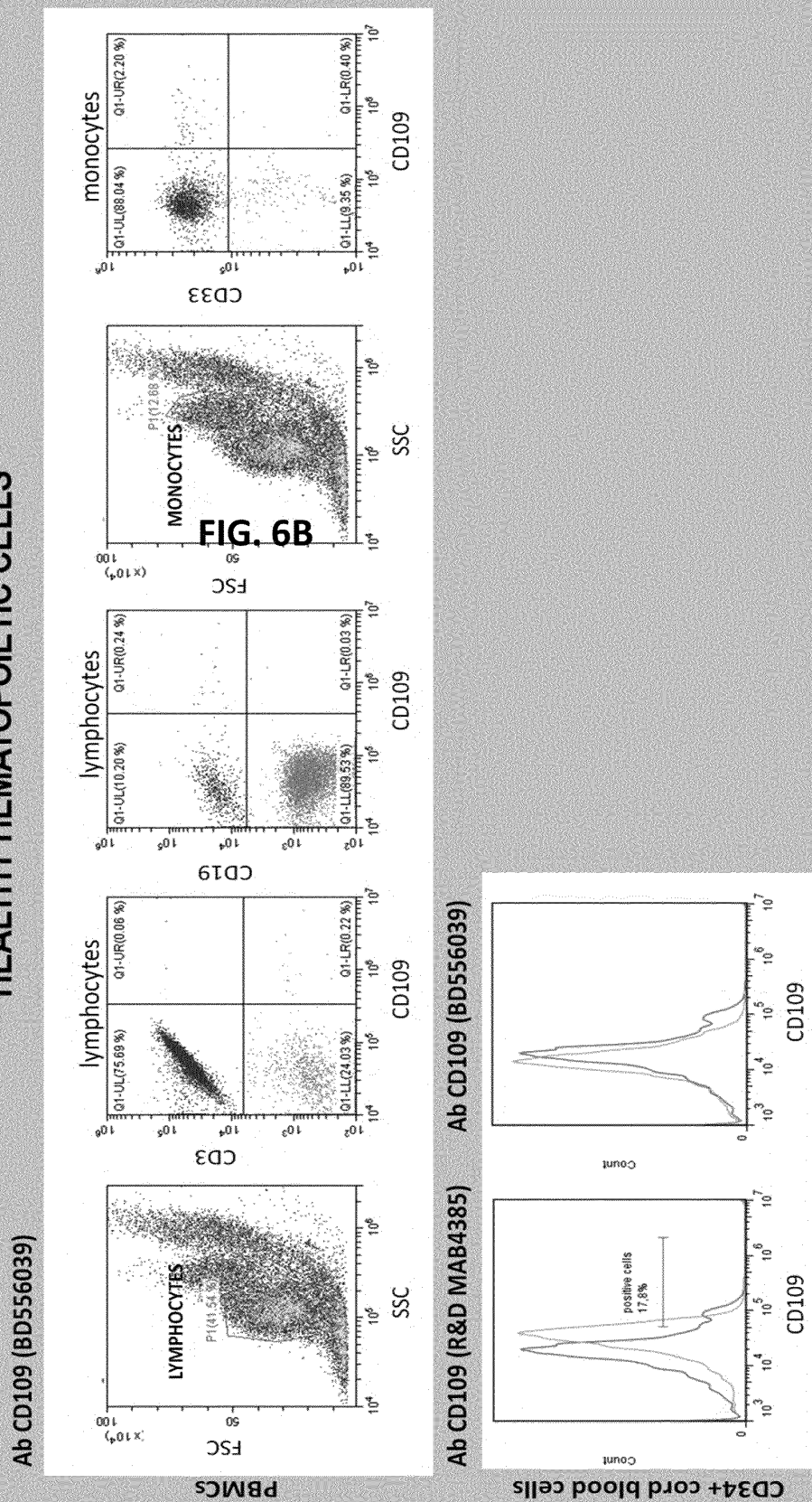


FIG. 7A

AML Cell Lines

Ab CD72 (Biolegend 316202)

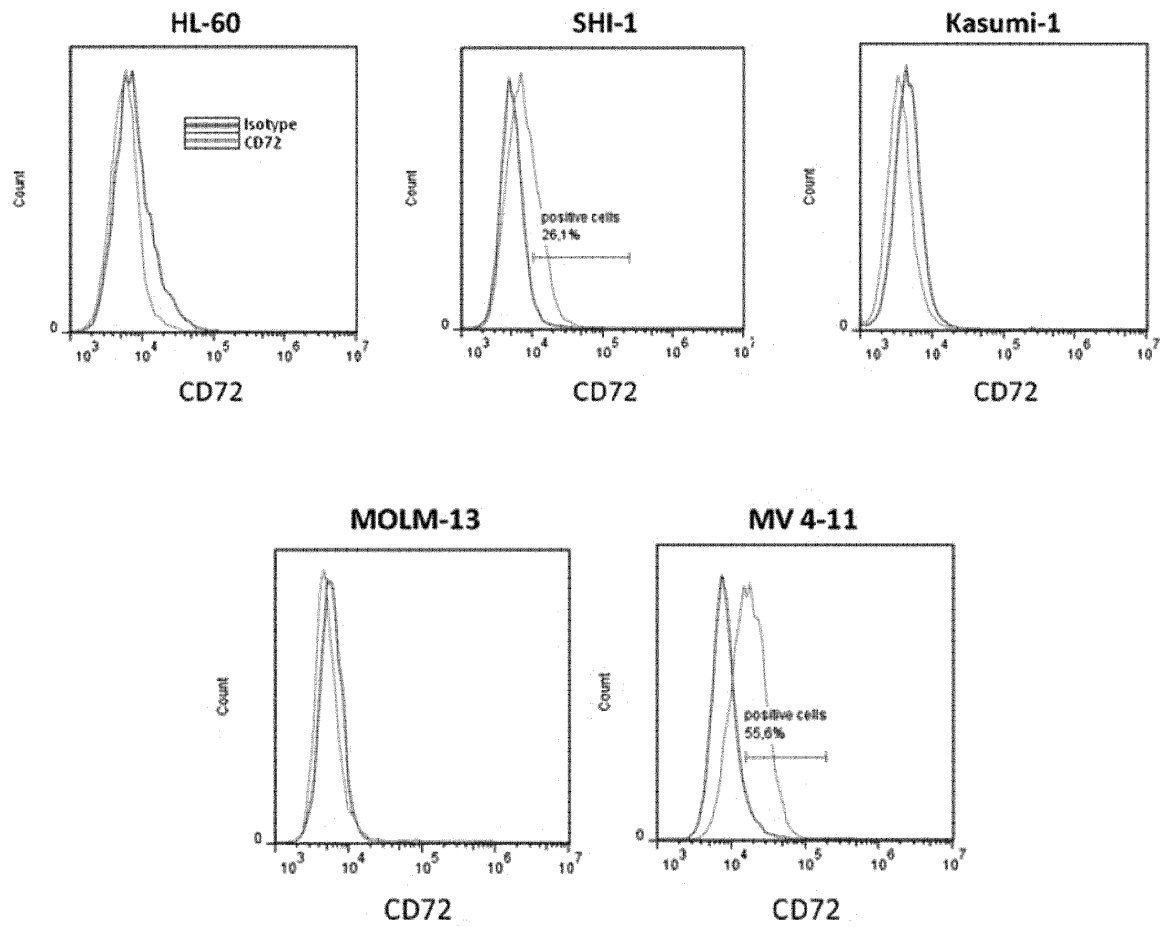


FIG. 7A (cont'd)

Ab CD72 (BD 555917)

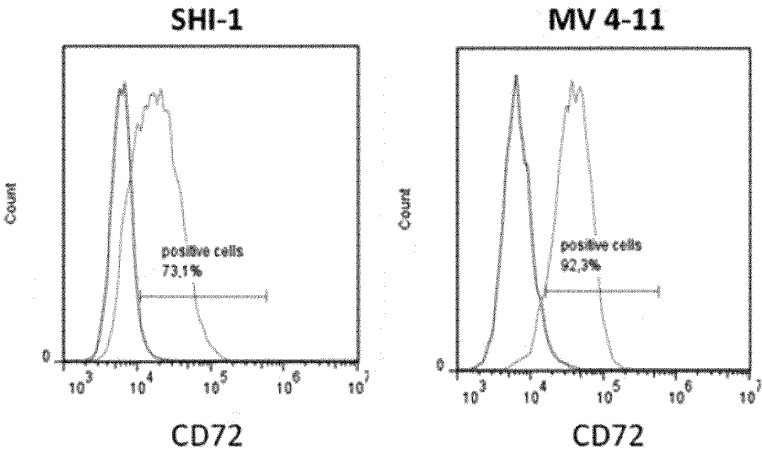


FIG. 7B

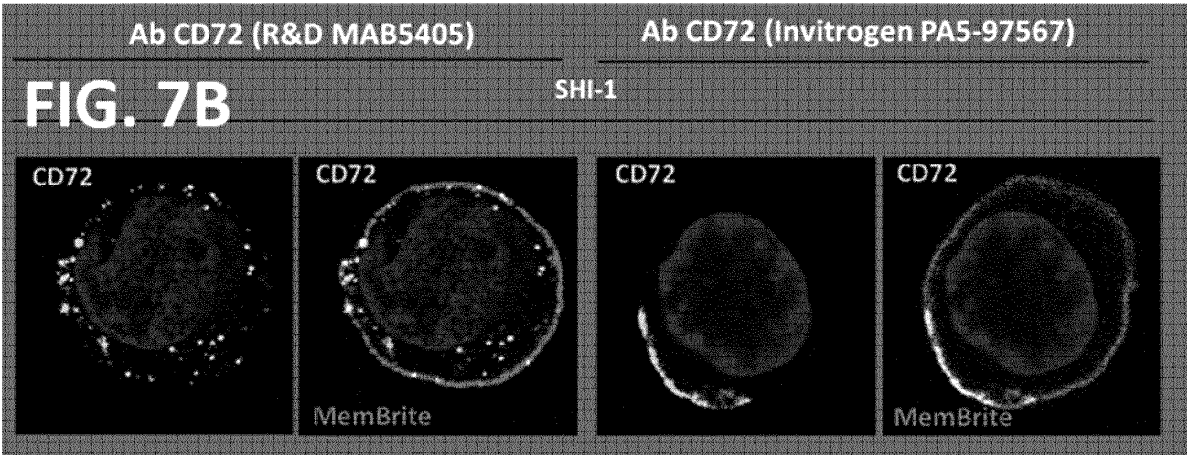
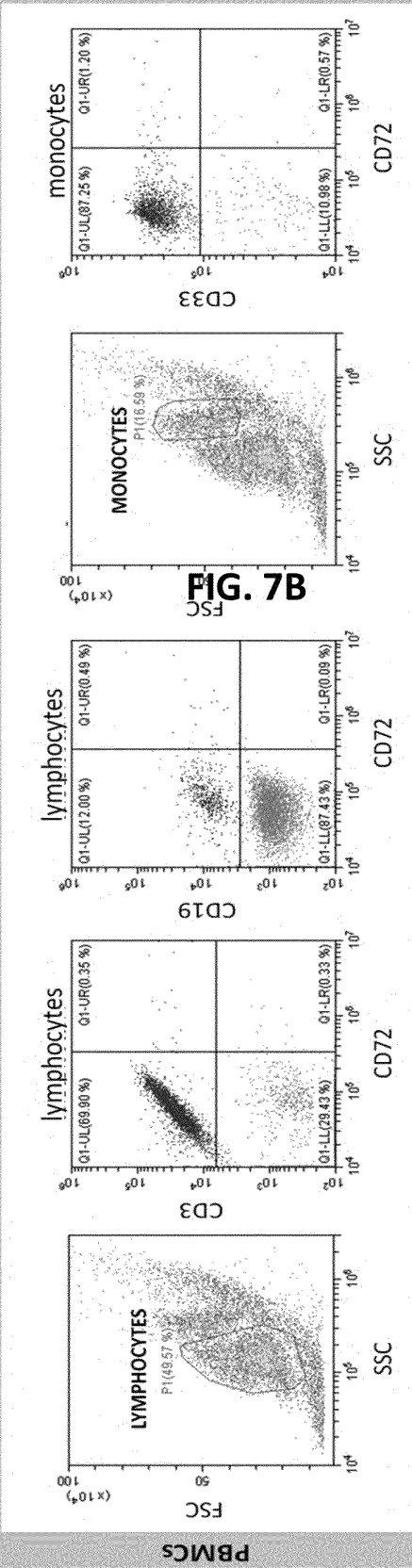


FIG. 7C

HEALTHY HEMATOPOIETIC CELLS

Ab CD72 (Biolegend 316202)



Ab CD72 (Biolegend 316202) Ab CD72 (R&D MAB5405)

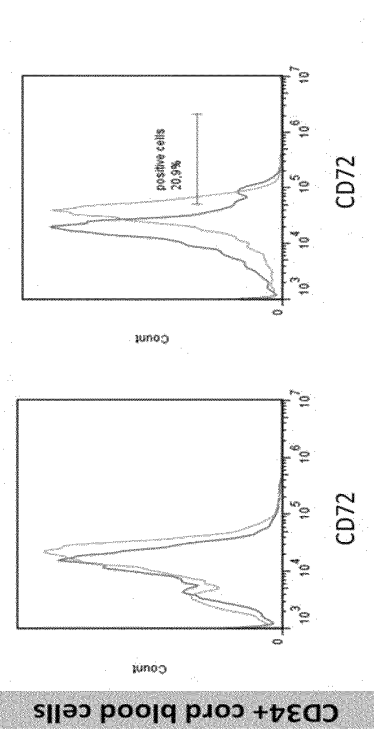


FIG. 8

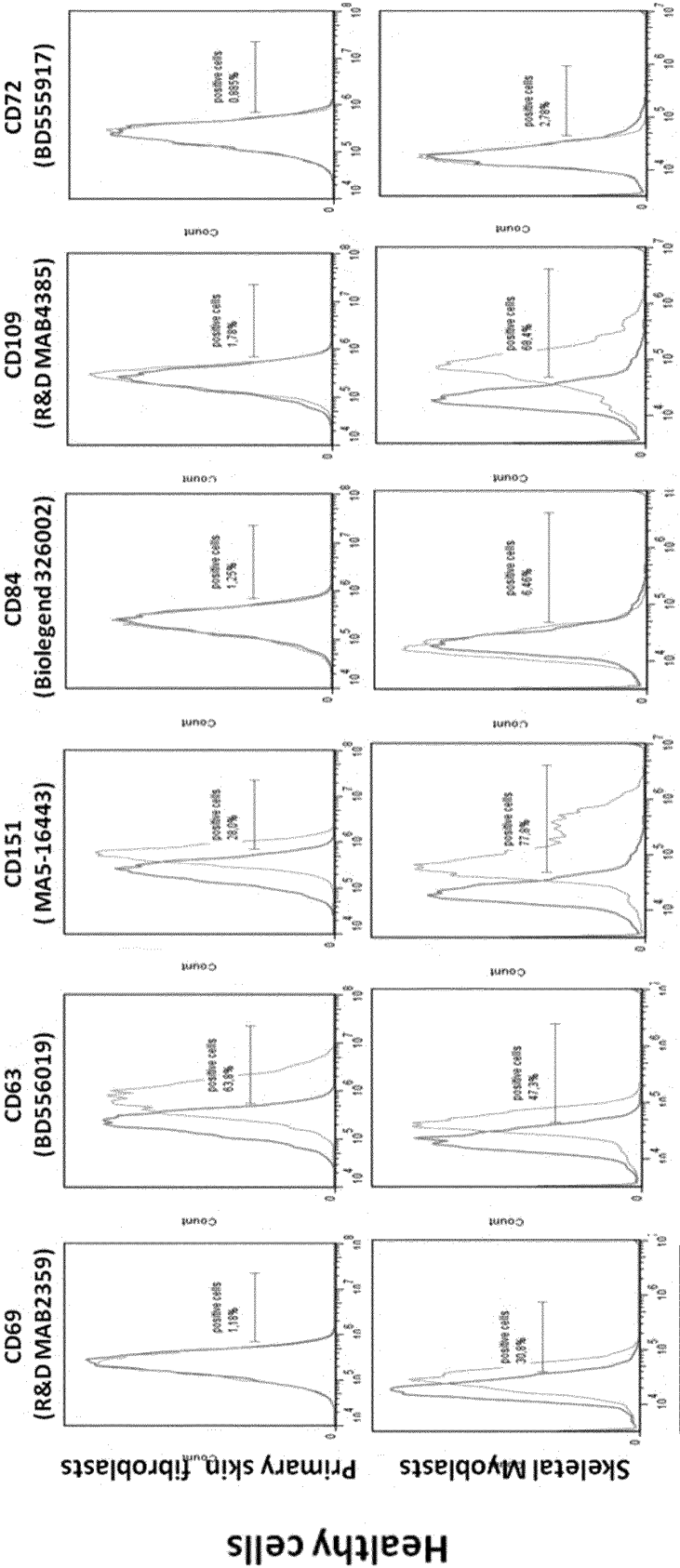


FIG. 8 (cont'd)

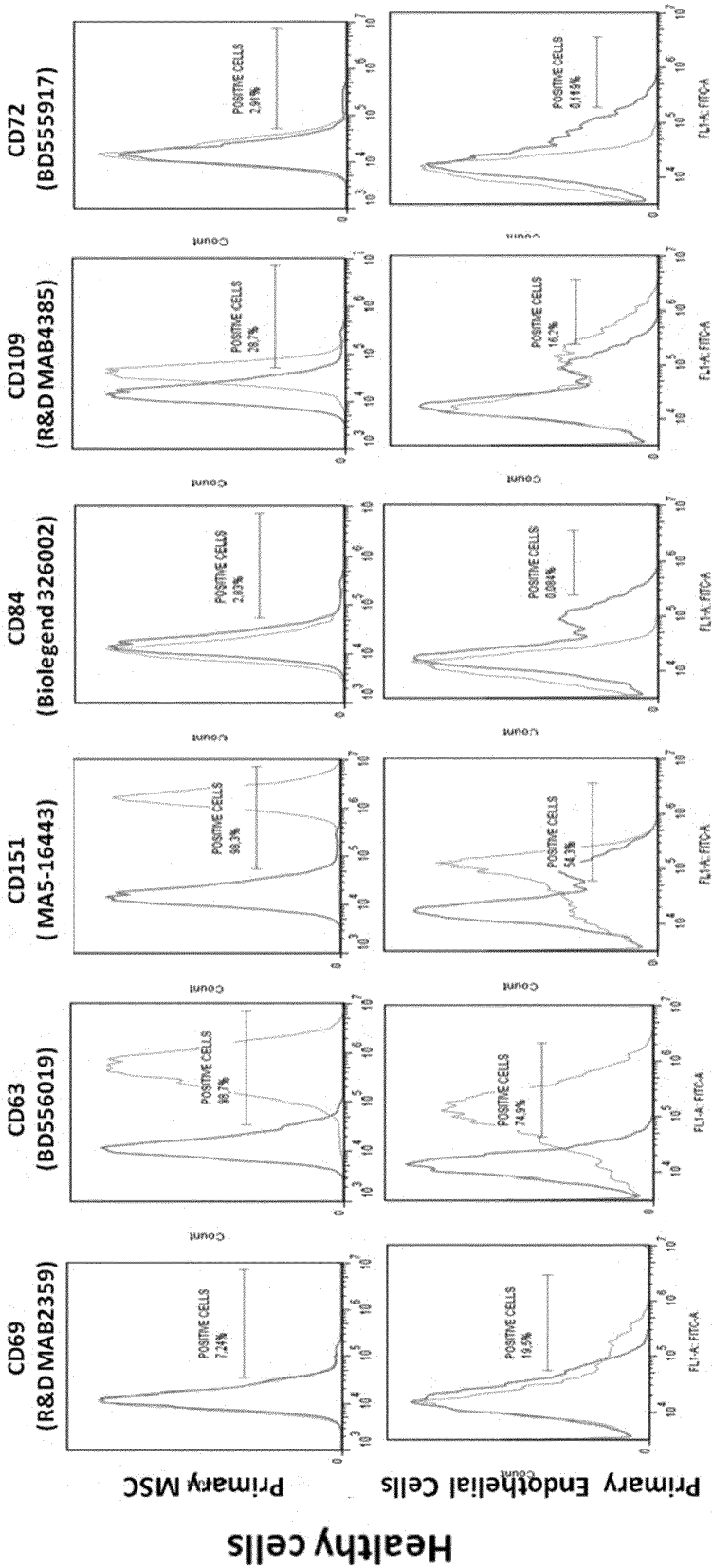


FIG. 9

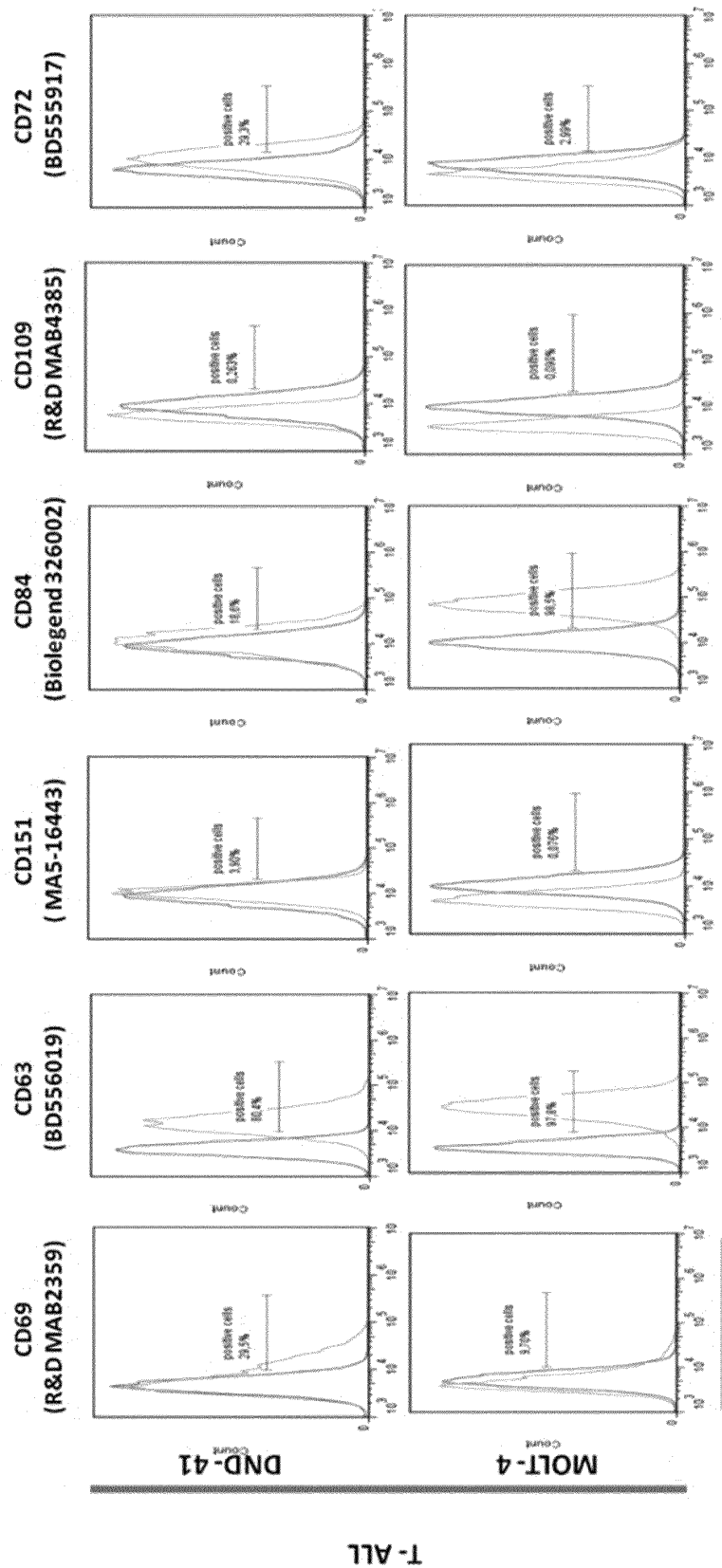


FIG. 9 (cont'd)

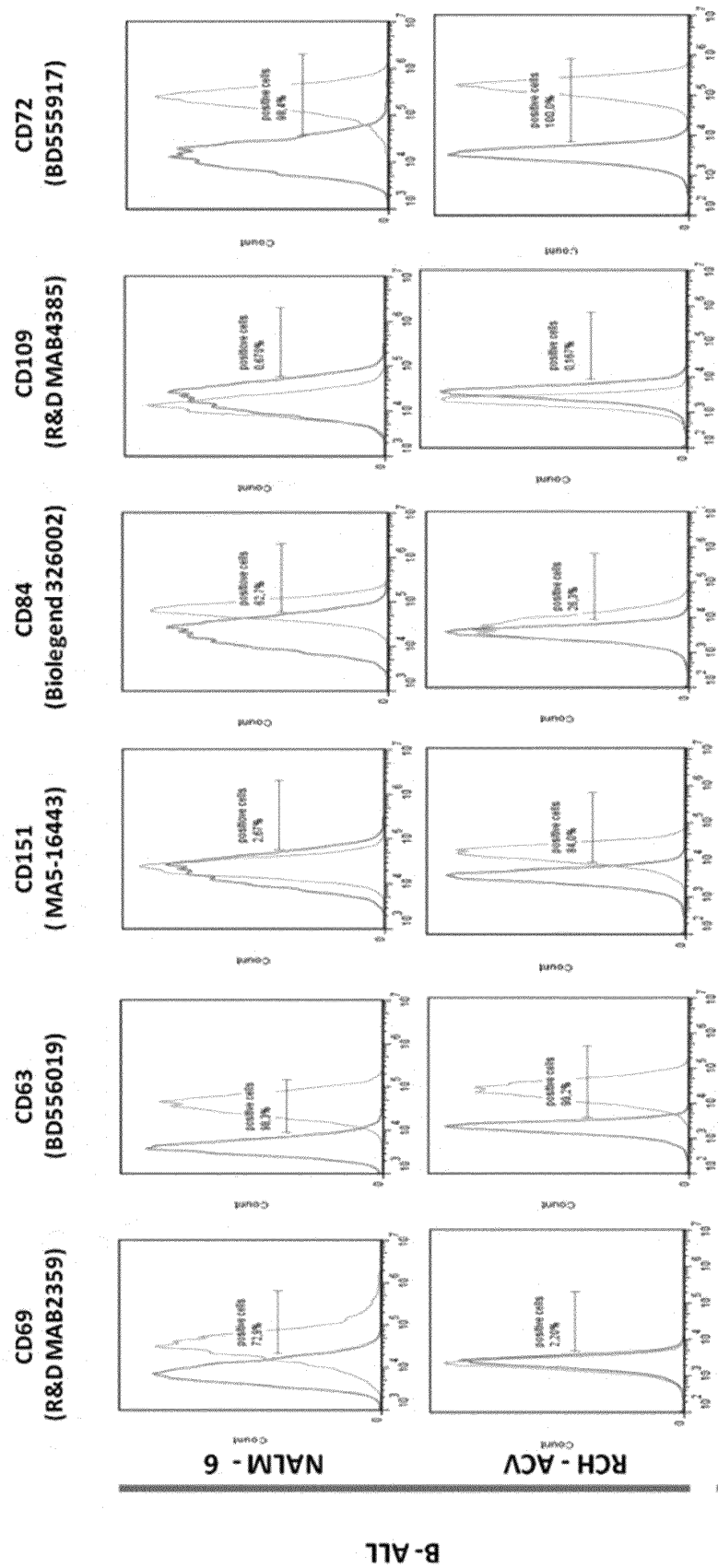


FIG. 9 (cont'd)

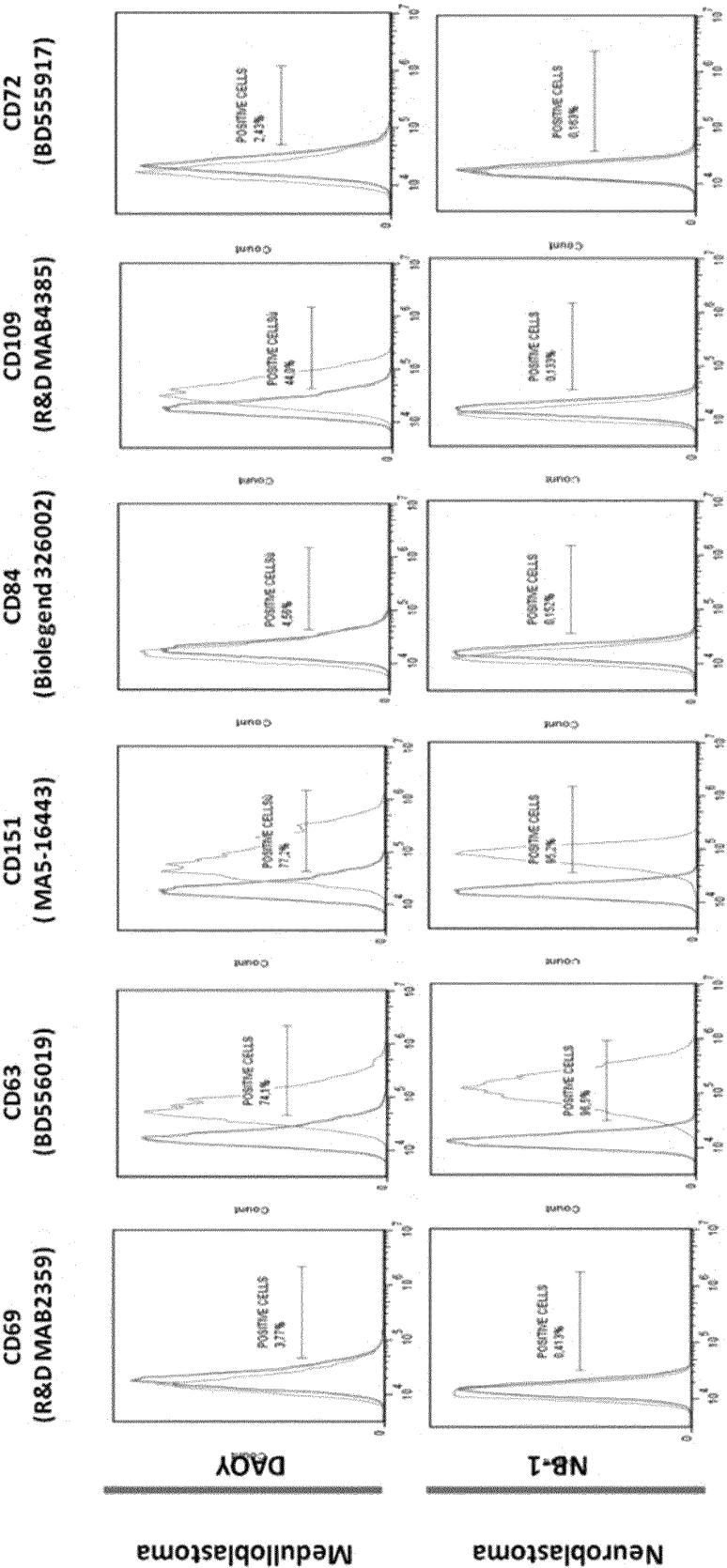


FIG. 9 (cont'd)

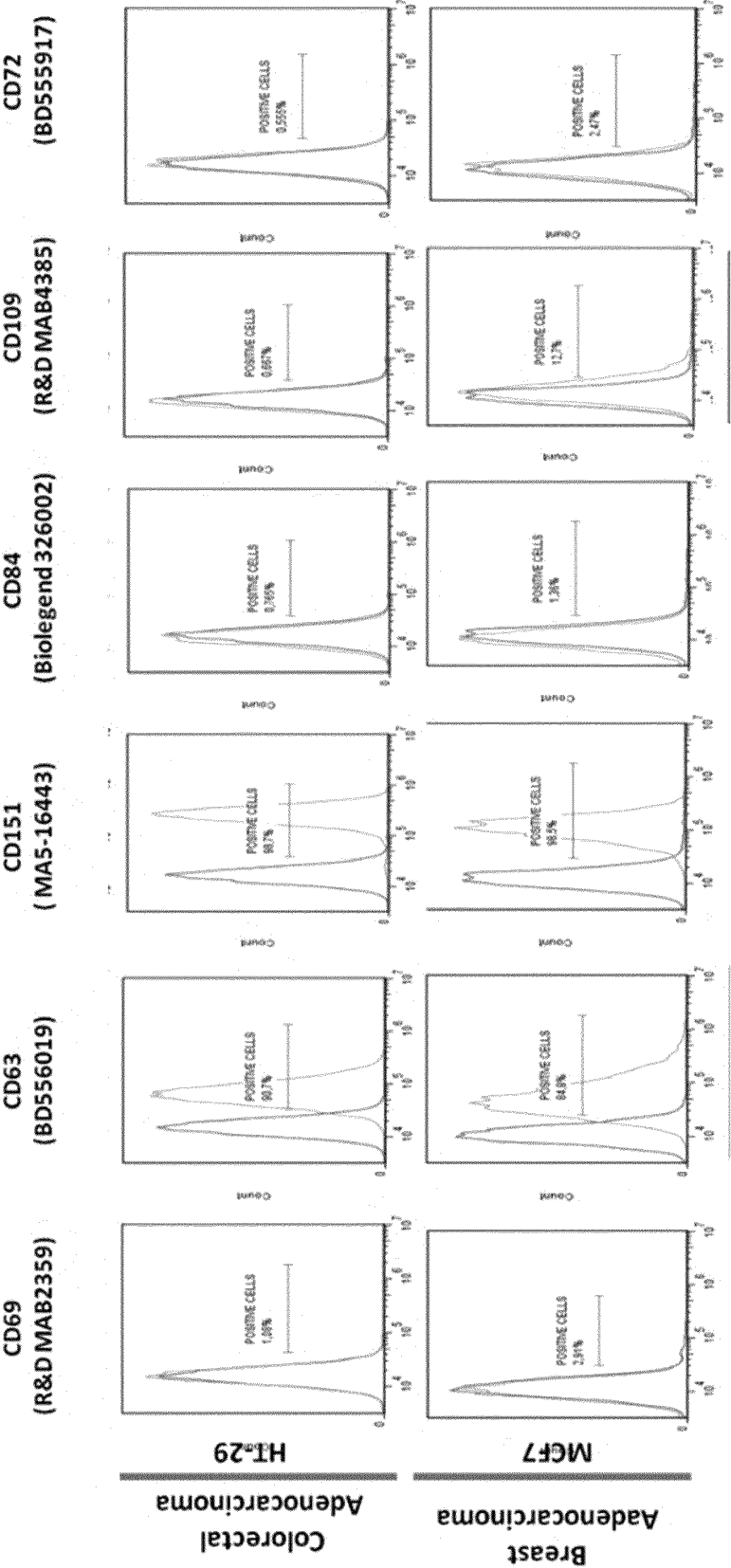


FIG. 9 (cont'd)

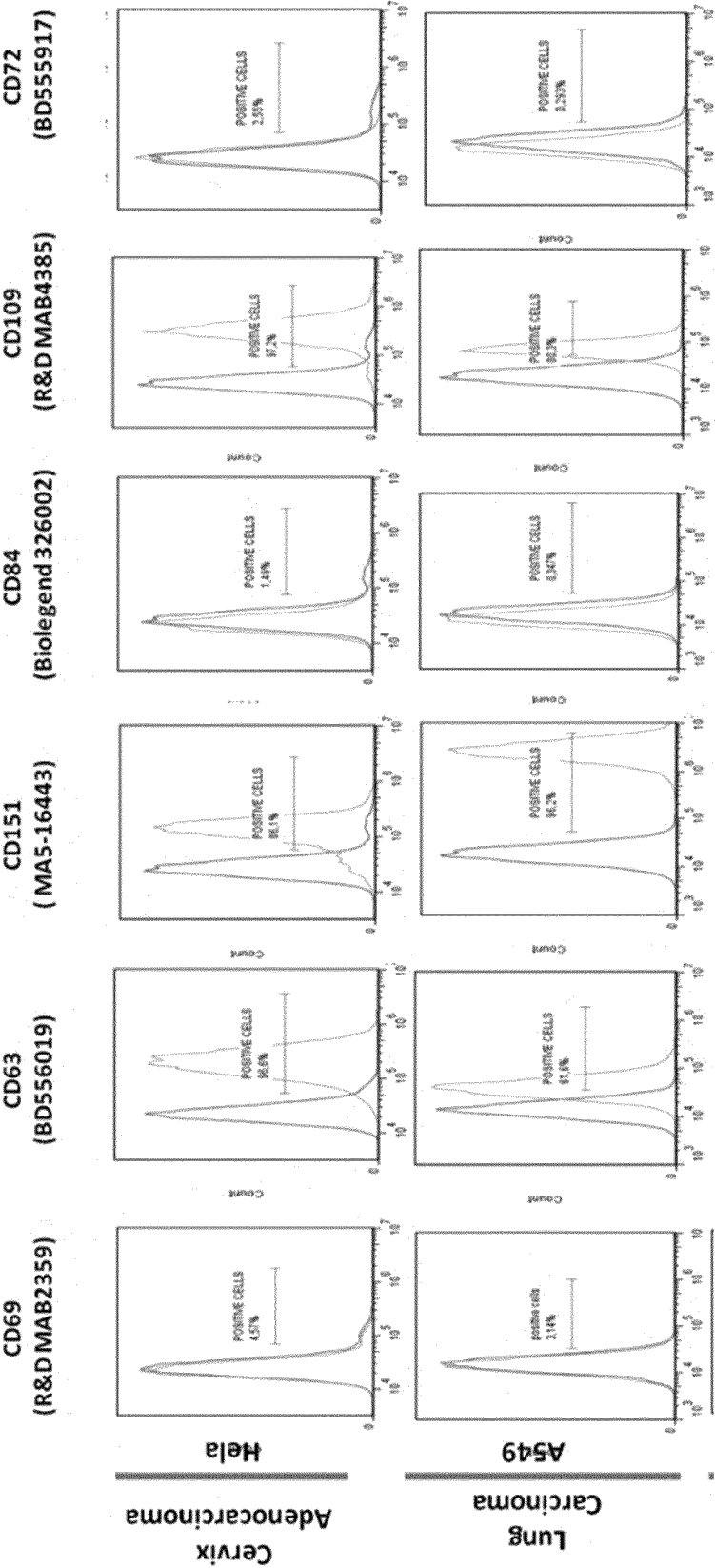


FIG. 9 (cont'd)

CD69 (R&D MAB2359) CD63 (BD556019) CD151 (MA5-16443) CD84 (Biolegend 326002) CD109 (R&D MAB4385) CD72 (BD555917)

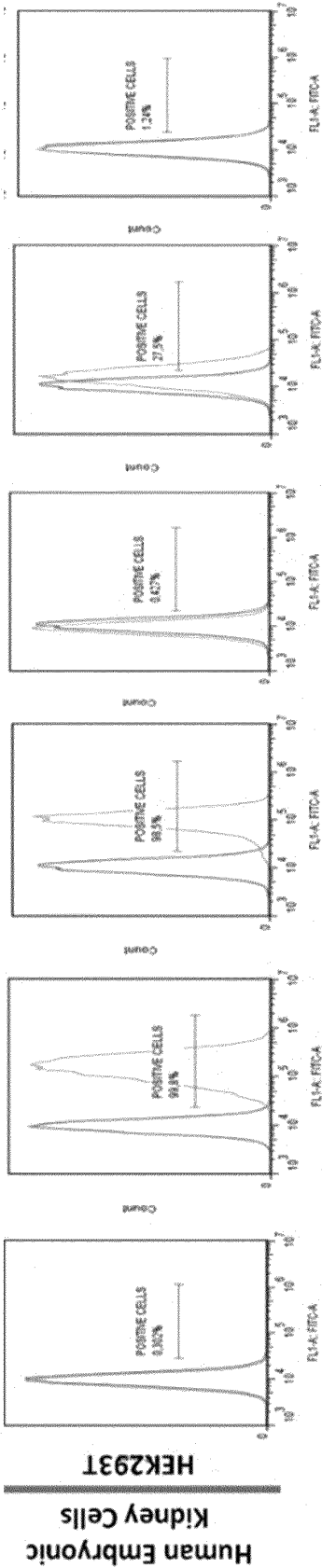


FIG. 10

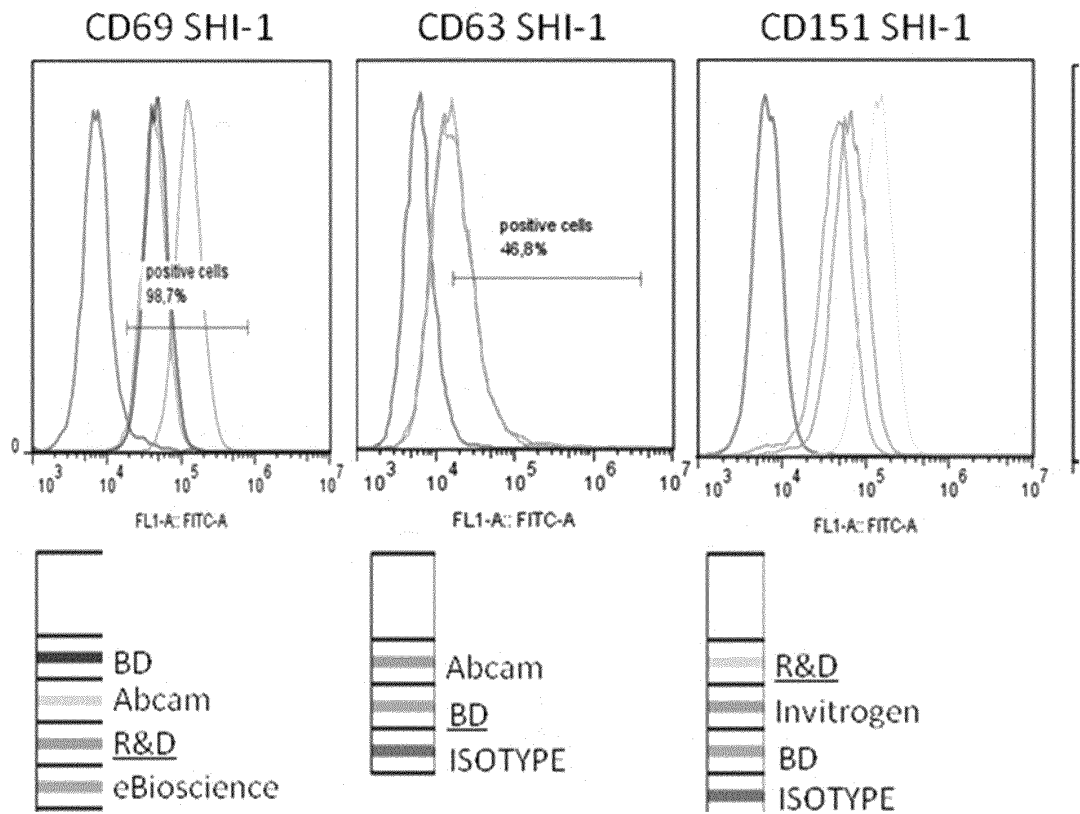


FIG. 10 (Continued)

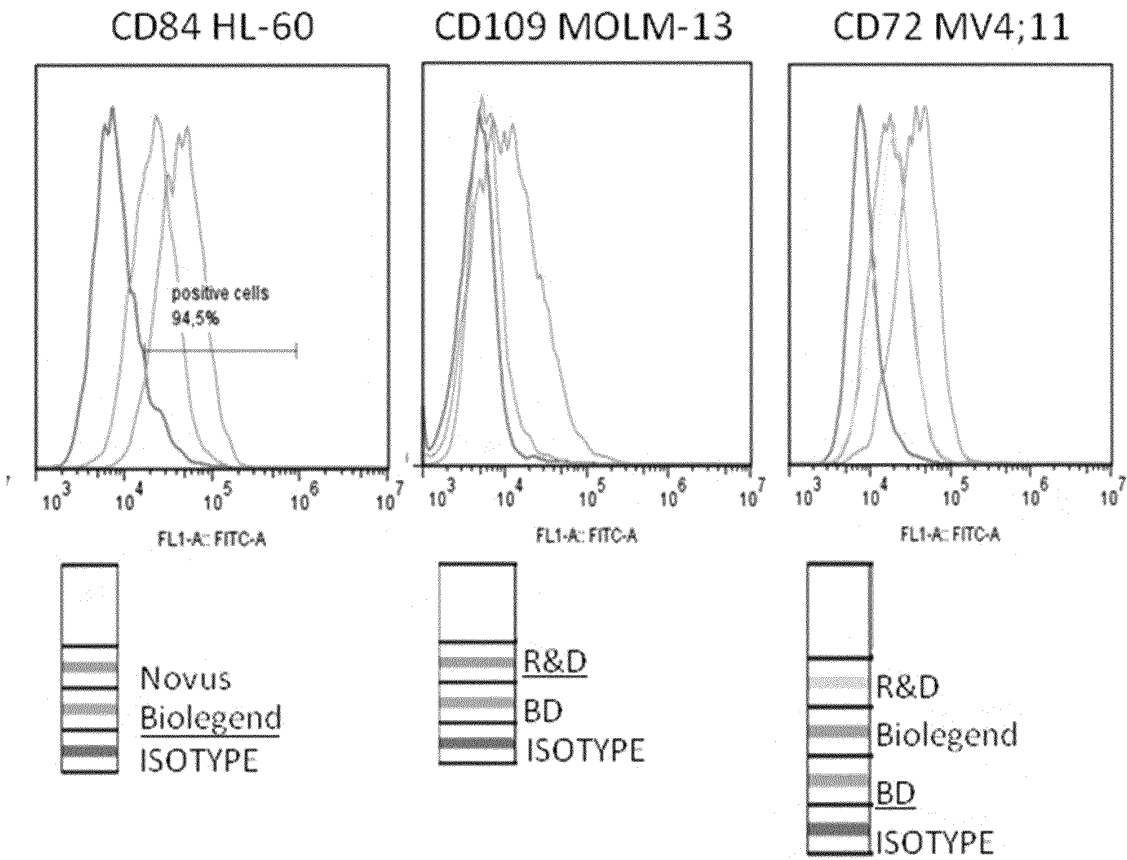


FIG. 11

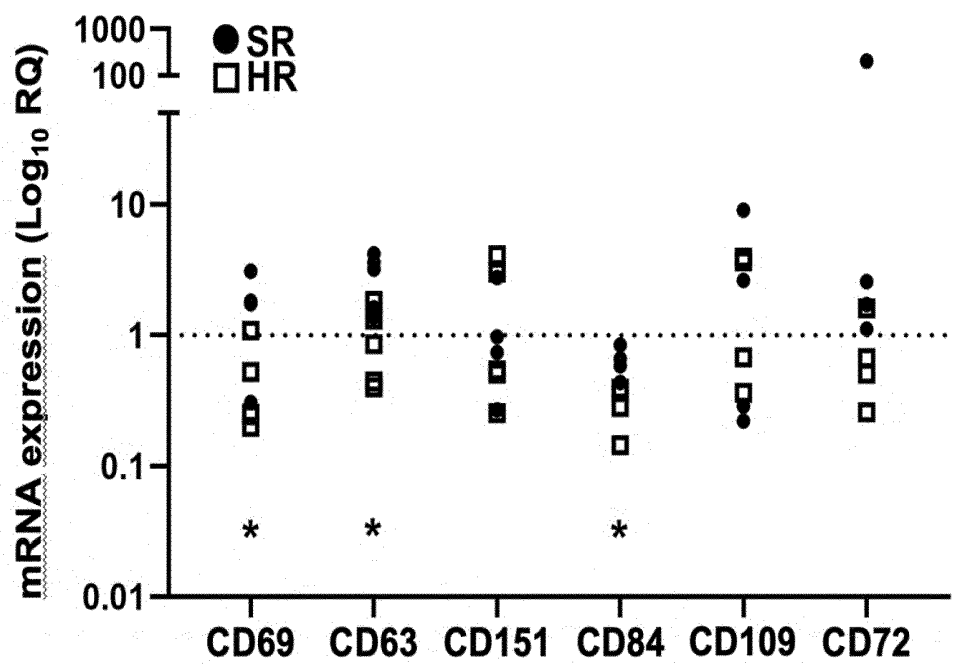


FIG. 12A

TSA expression in healthy CD34⁺CD38⁻

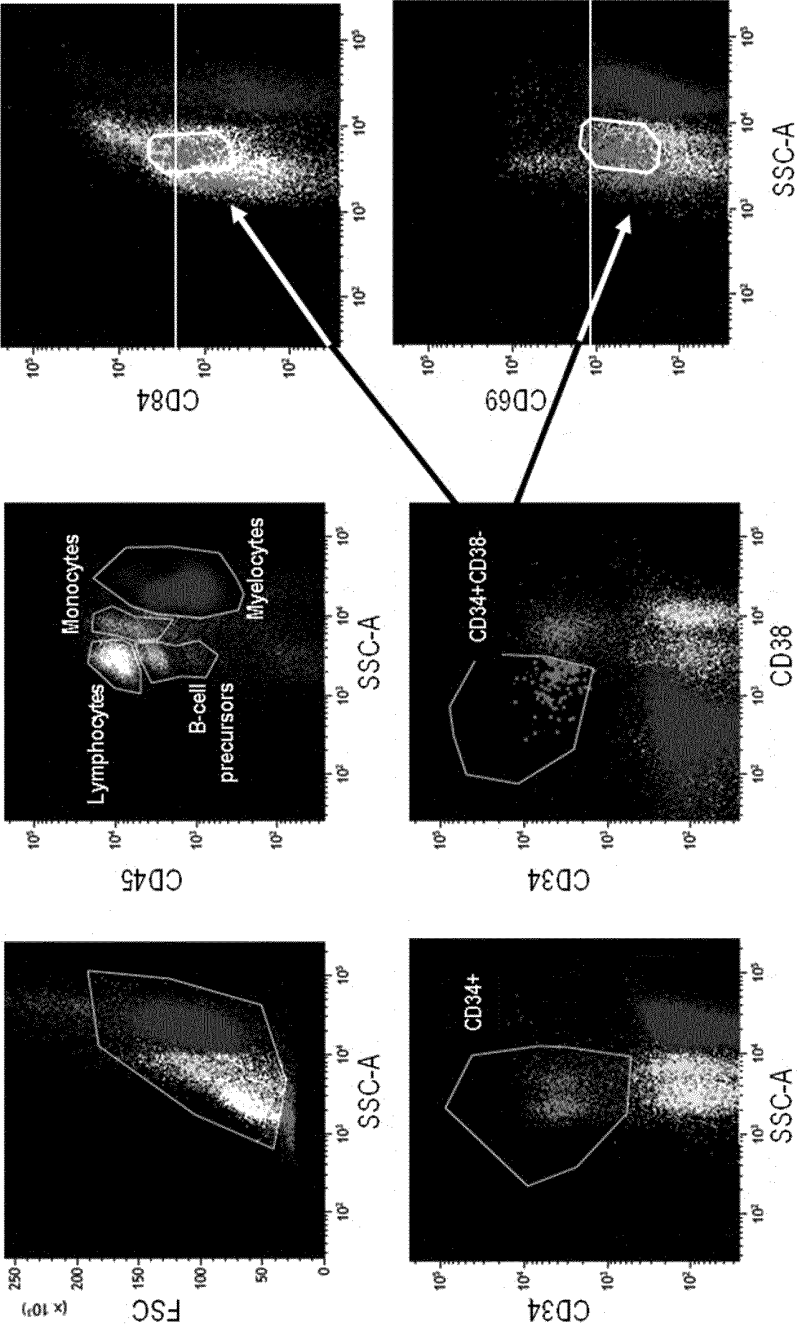


FIG. 12B

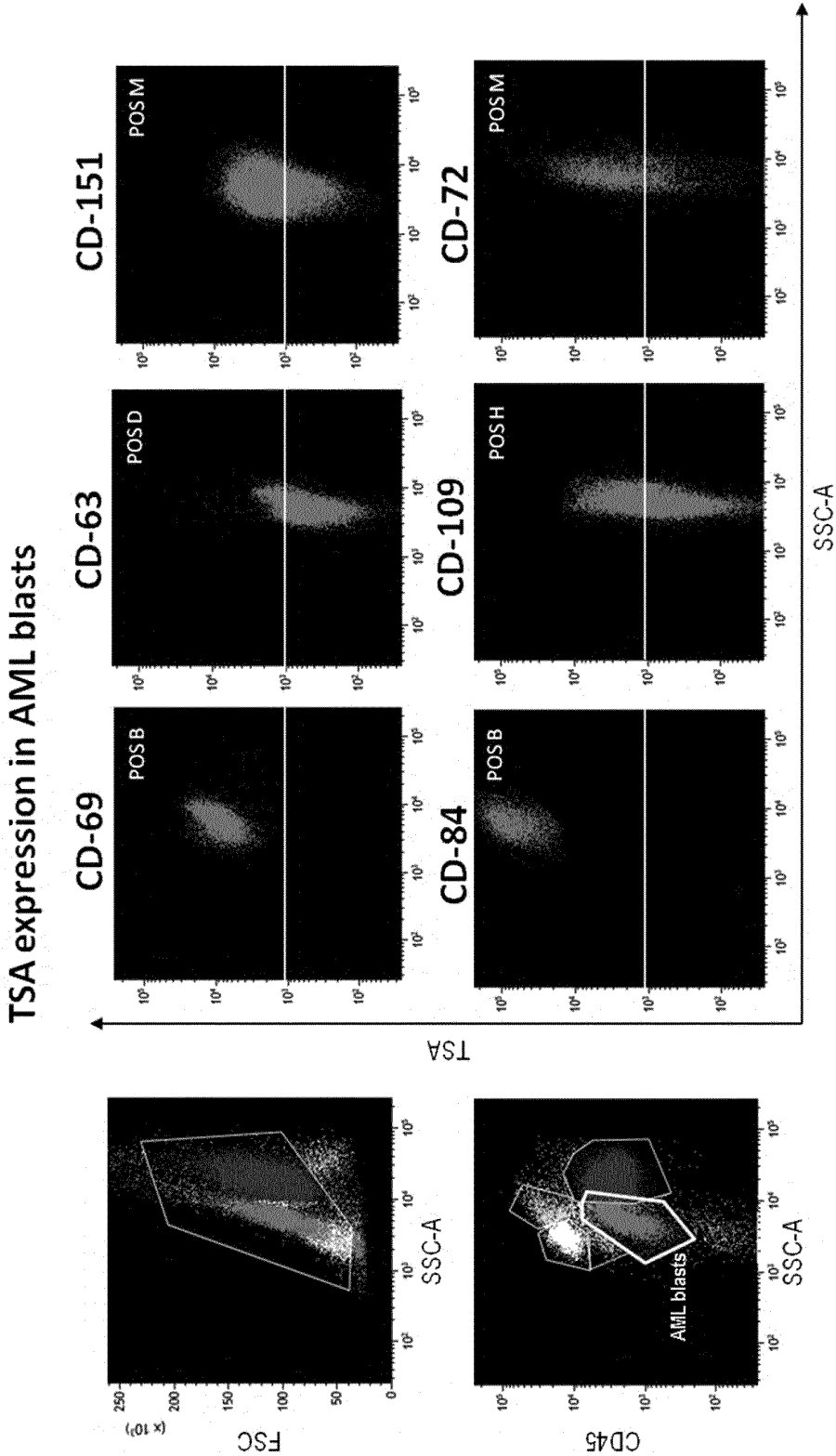


FIG. 13

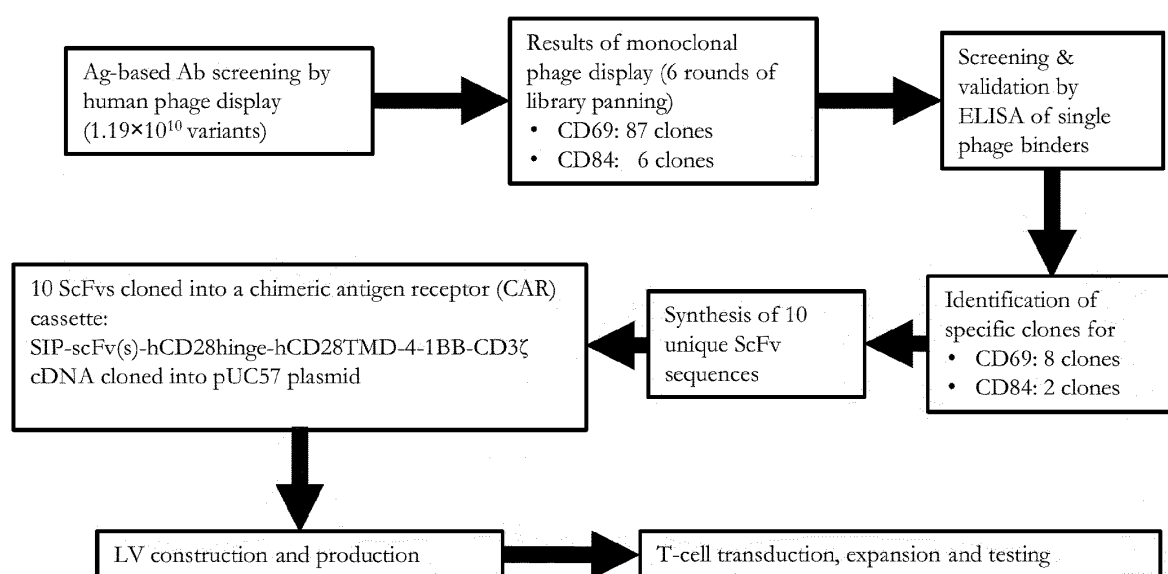


FIG. 14

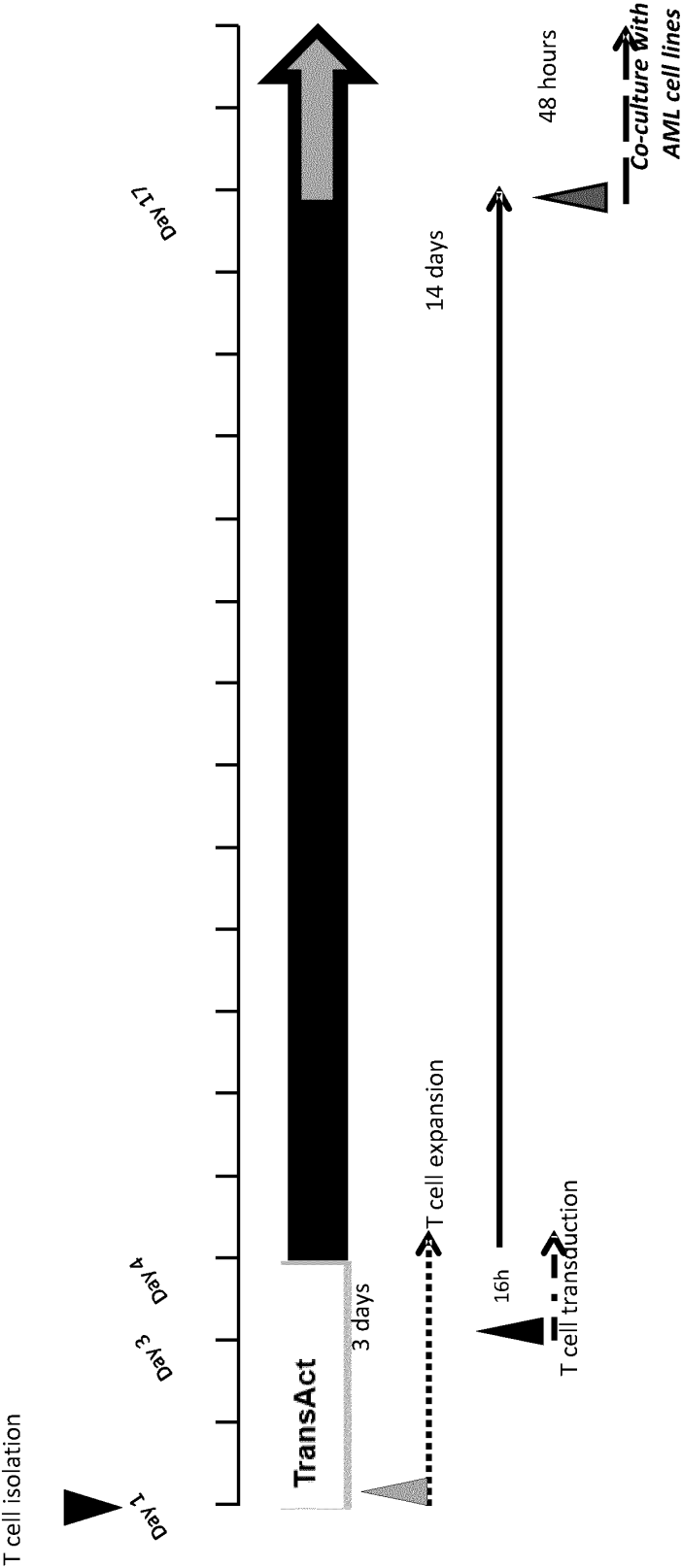


Figure 2 is a scatter plot showing the number of VCN (Y-axis, 0 to 40) for different CAR constructs (X-axis: empty CAR, B8, F12, G1, H3). The data points are represented by black circles, squares, and triangles, with error bars indicating standard deviation. The G1 construct shows a mean VCN of approximately 14, while H3 shows a mean VCN of approximately 18. The empty CAR construct shows a mean VCN of approximately 0.

Construct	VCN (Mean ± SD)
empty CAR	0 ± 0
B8	9.5 ± 1.5
F12	12 ± 5
G1	14 ± 1
H3	18 ± 6

FIG. 16

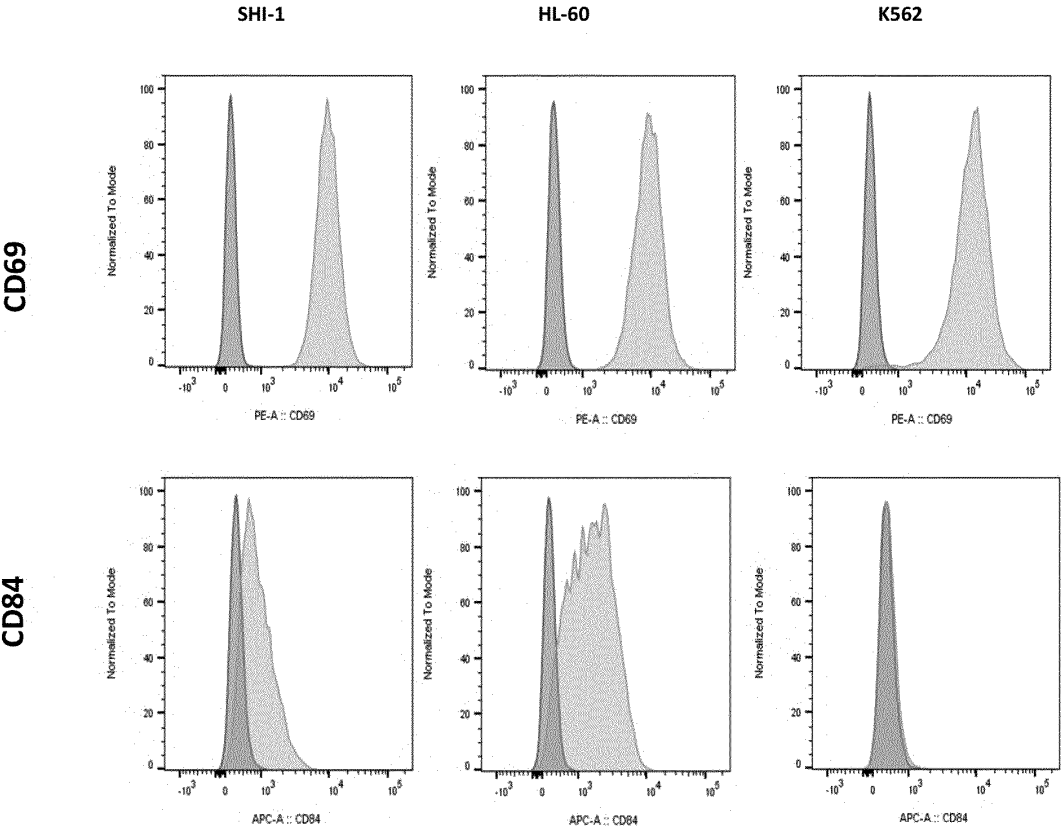


FIG. 16 (continued)

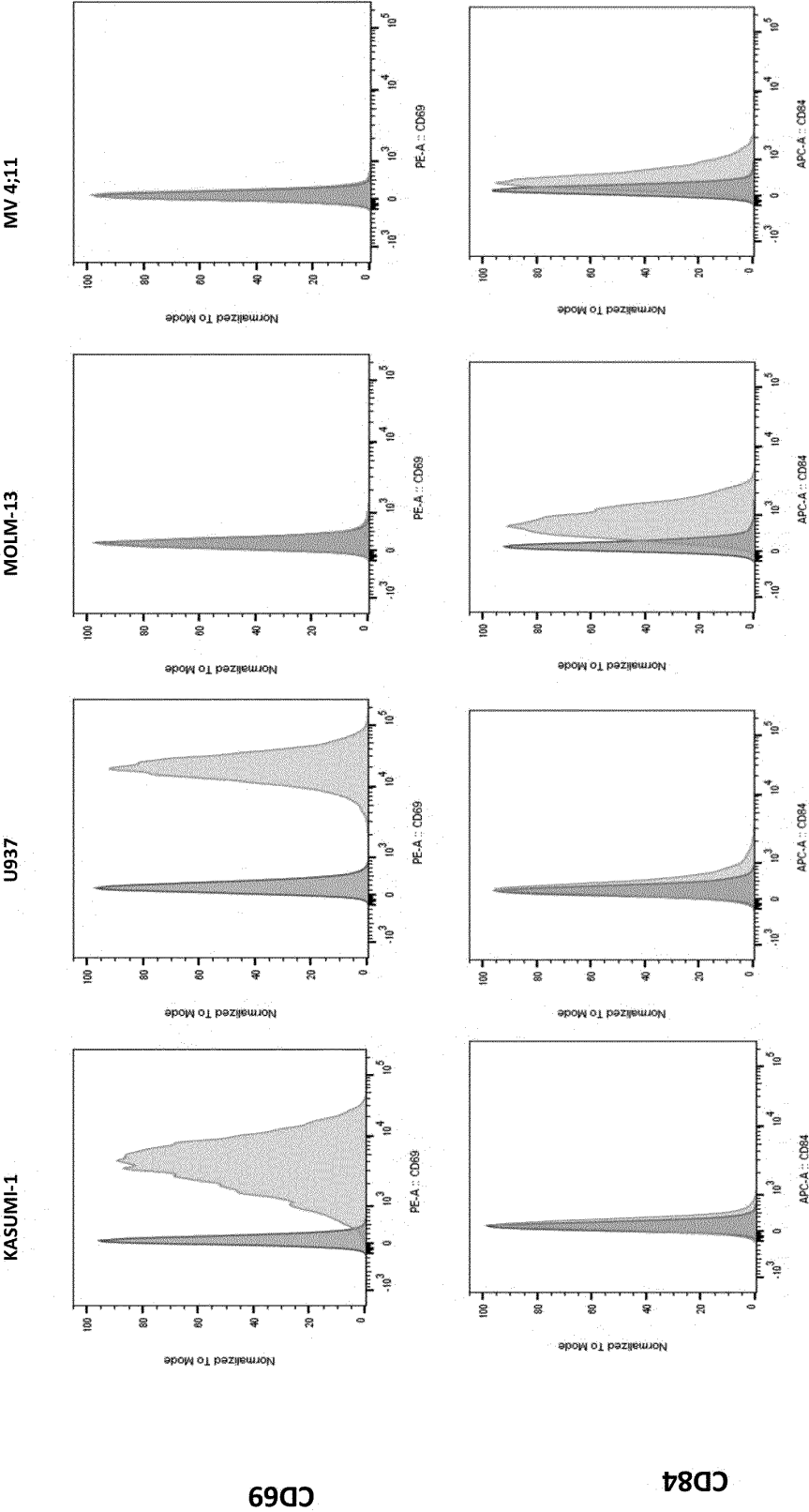


FIG. 17

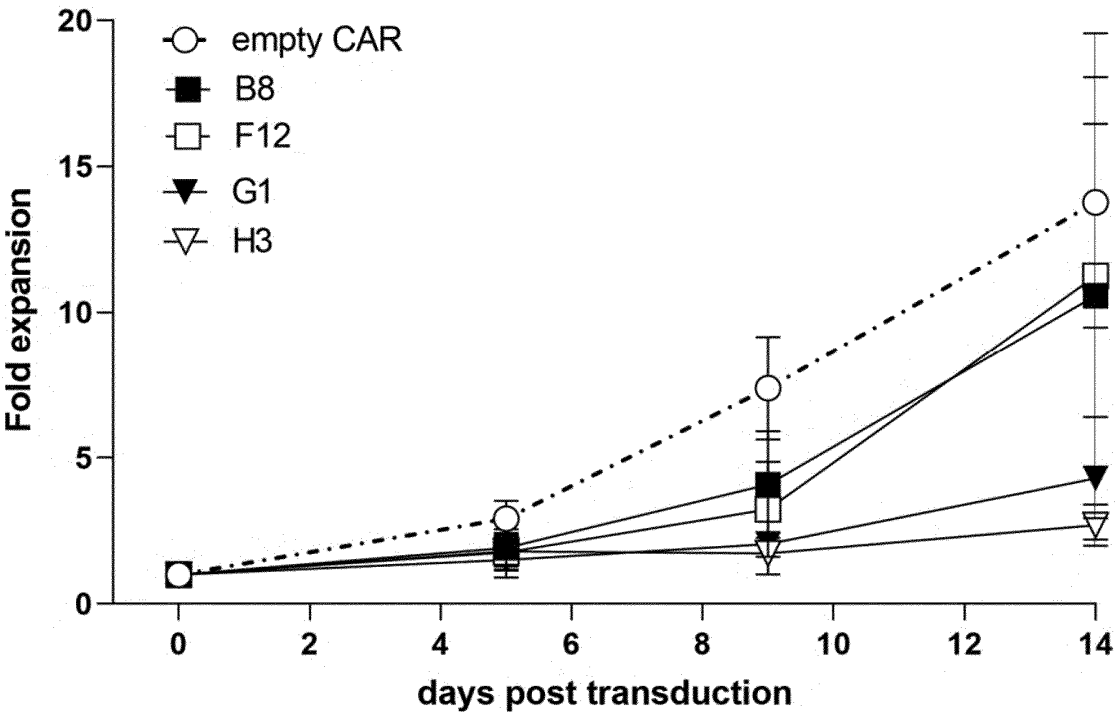


FIG. 18A

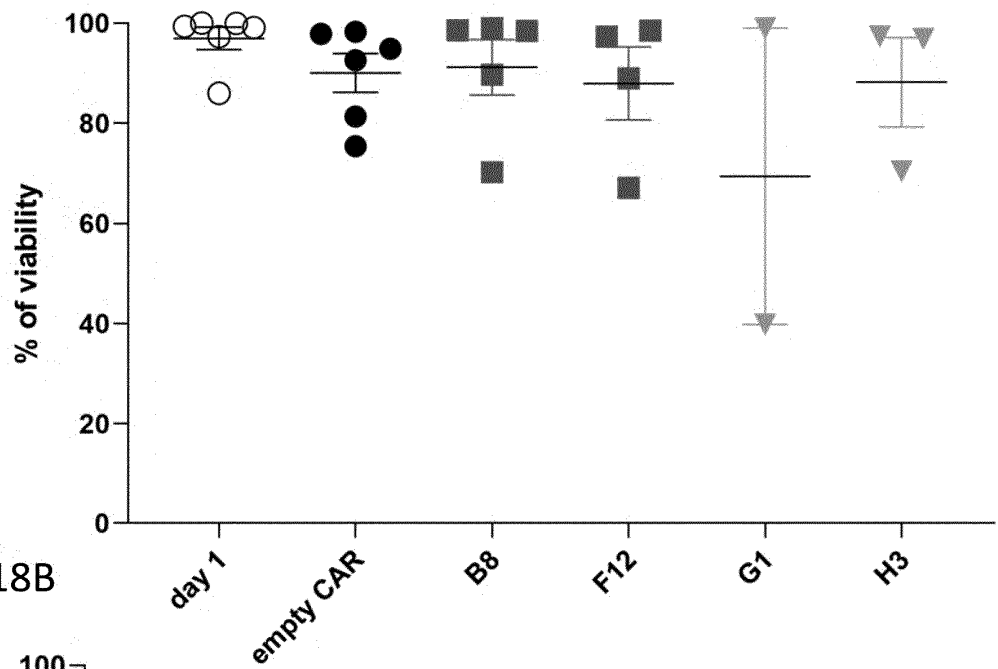


FIG. 18B

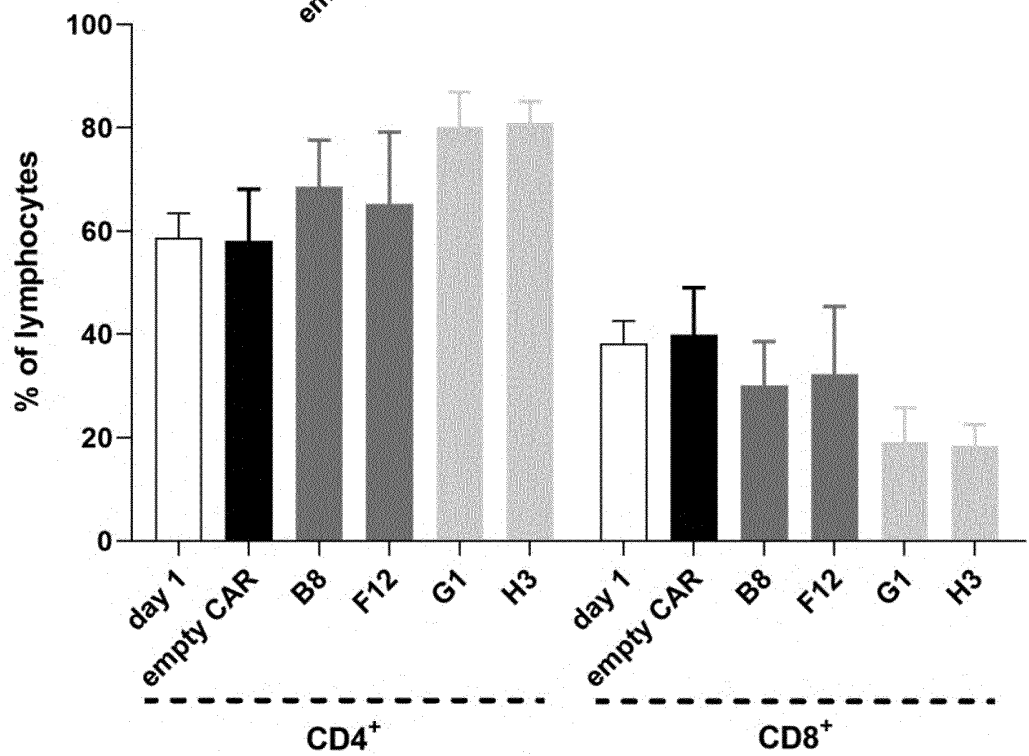


FIG. 19A

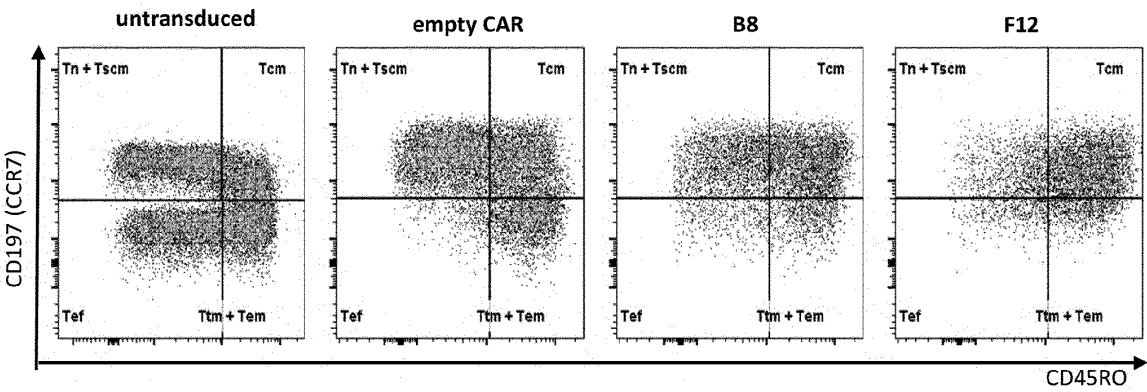


FIG. 19B

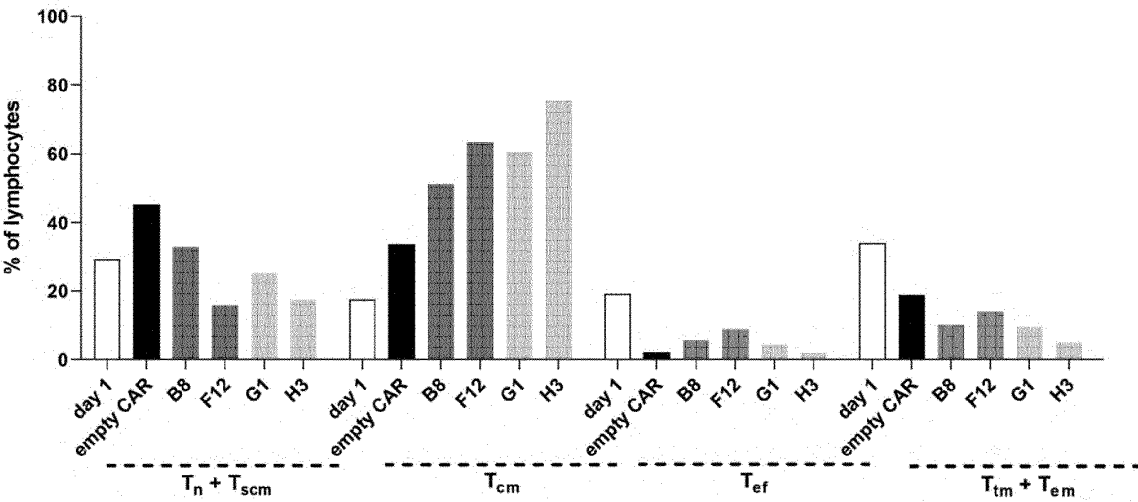


FIG. 20A

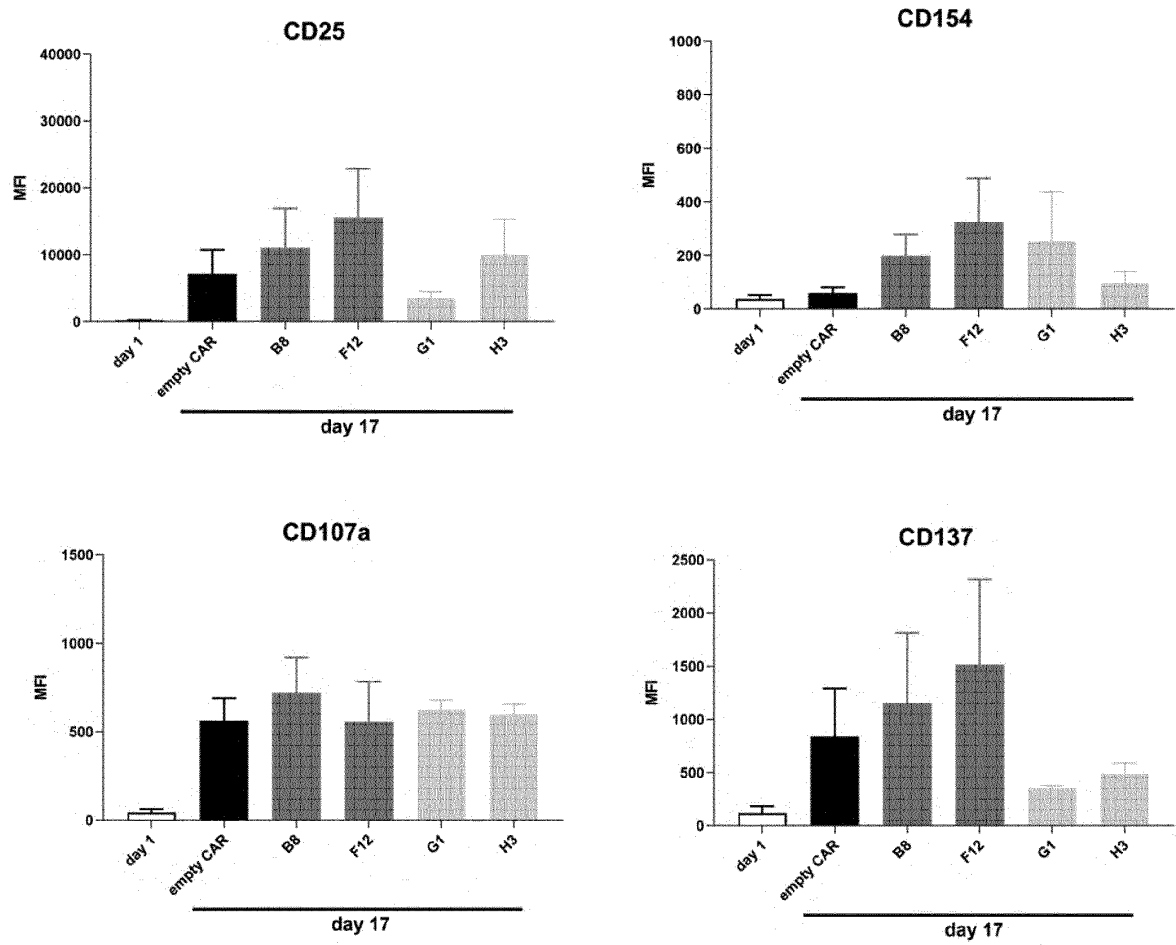


FIG. 20B

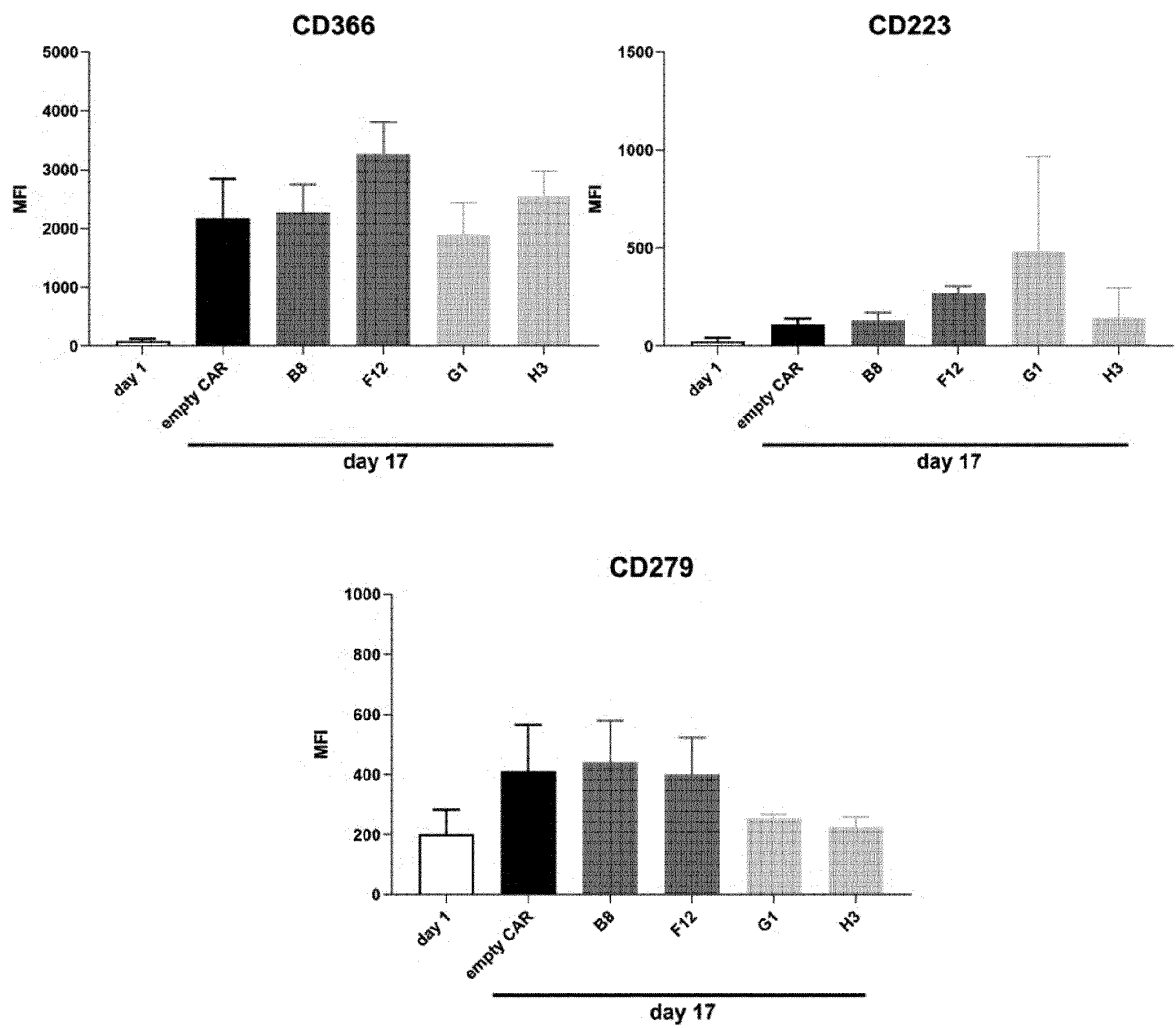


FIG. 21

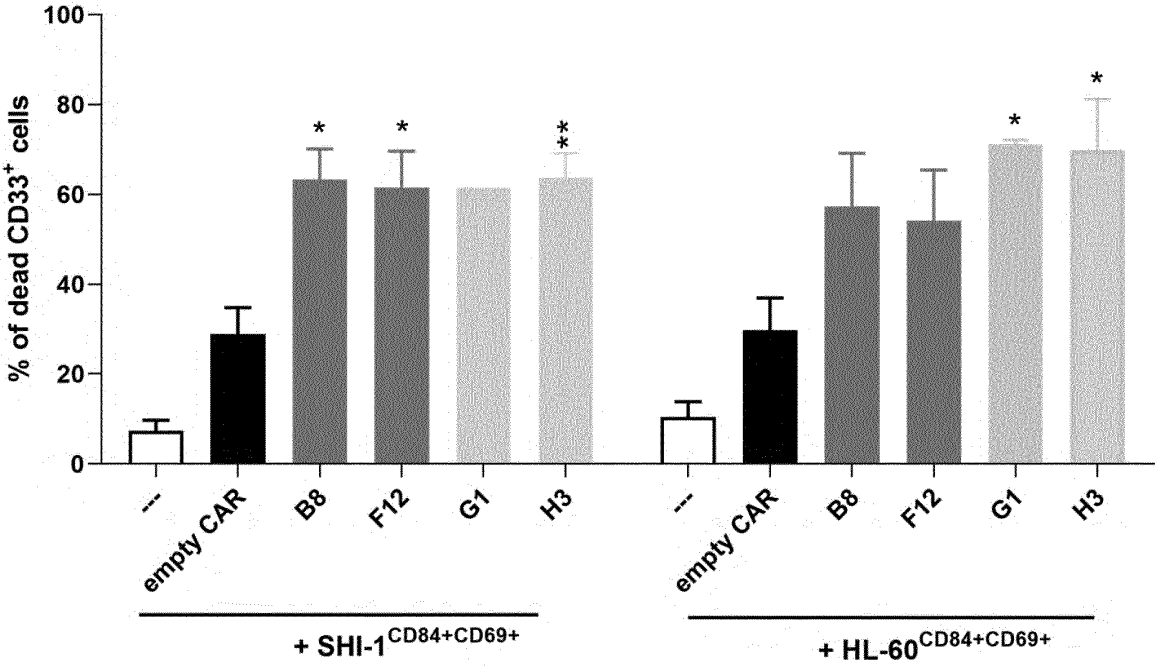


FIG. 22

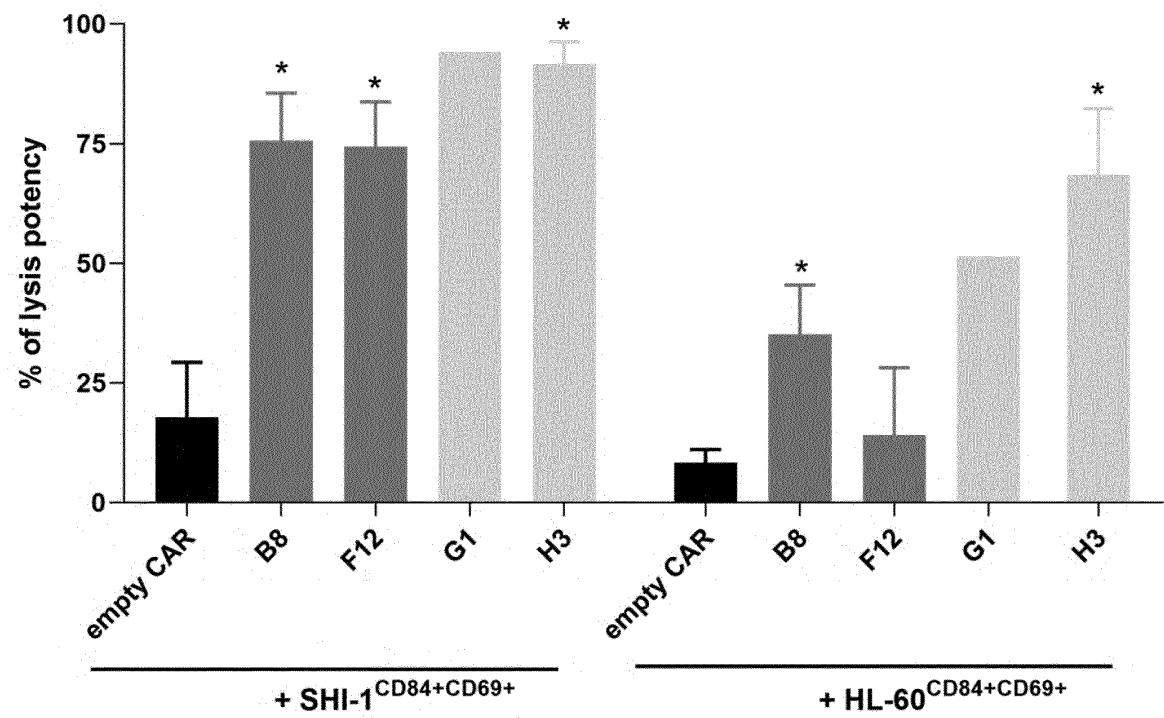


FIG. 23

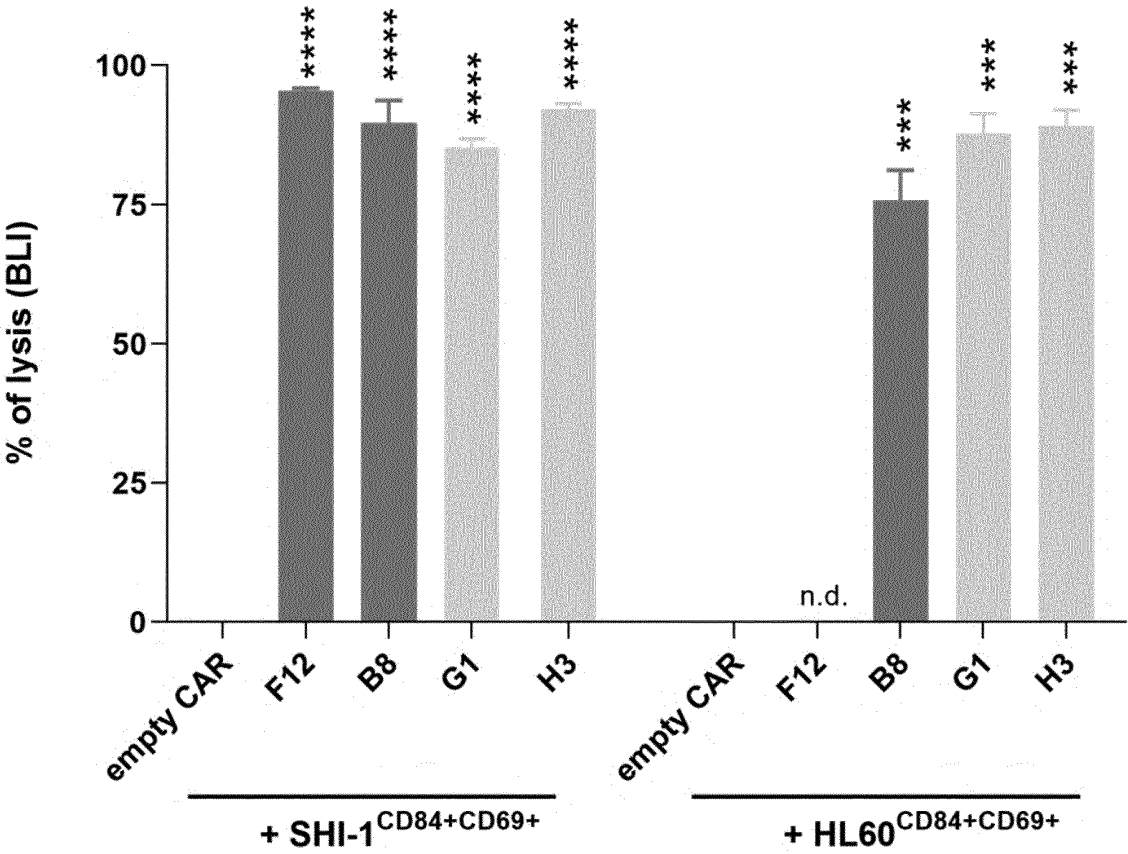


FIG. 24

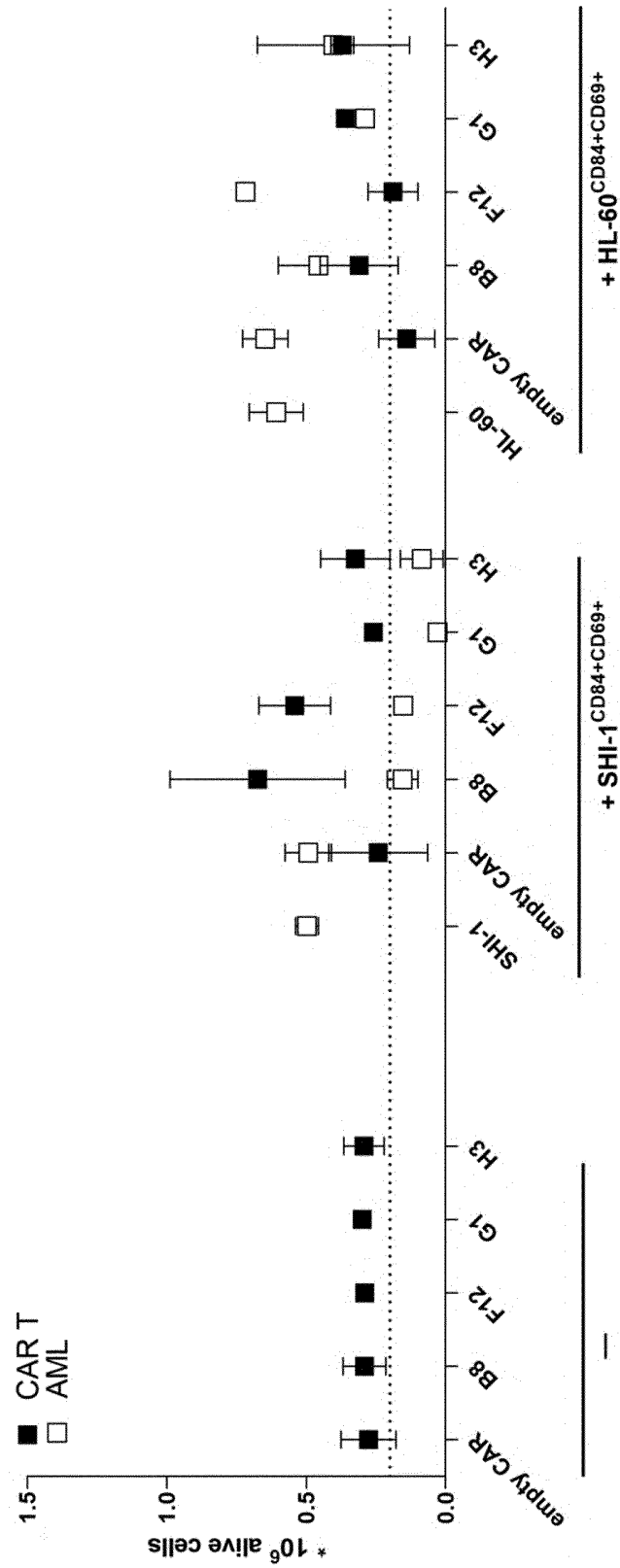


FIG. 25A

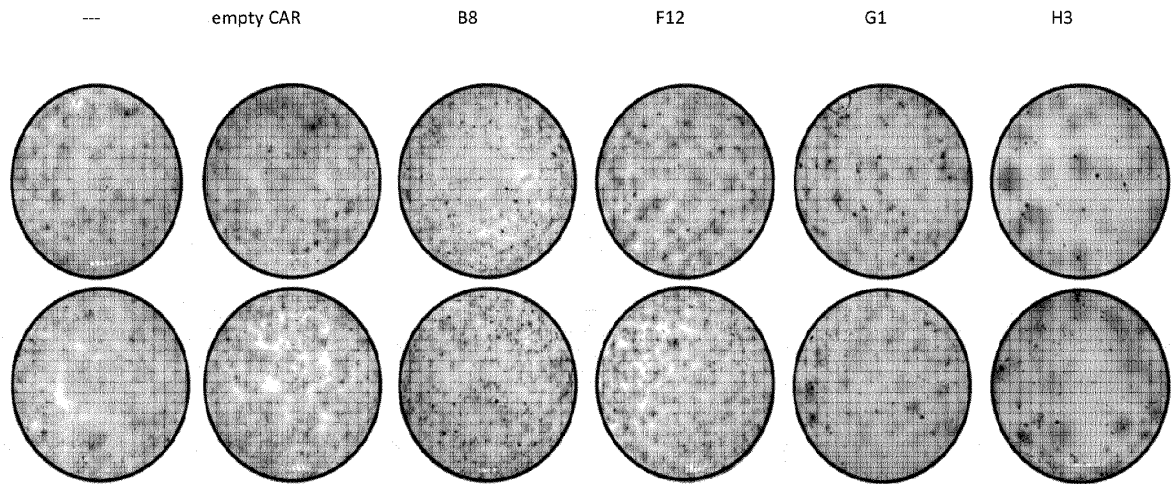


FIG. 25B

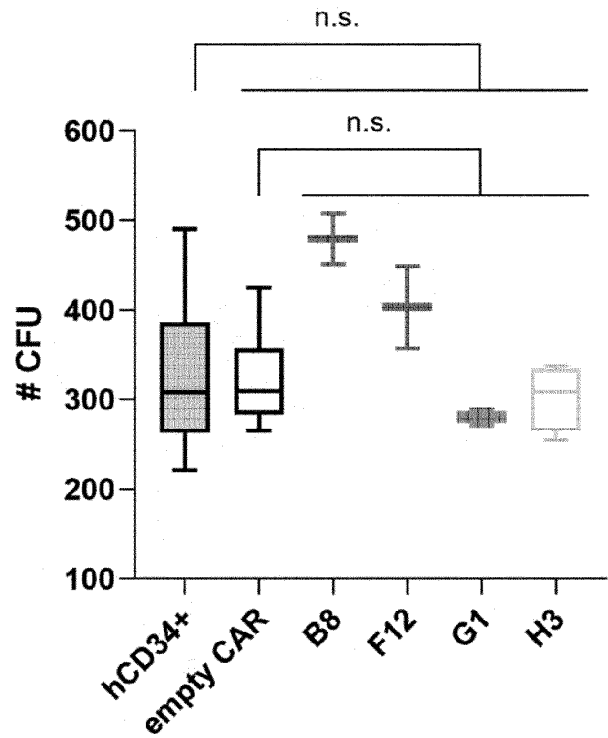


FIG. 26A

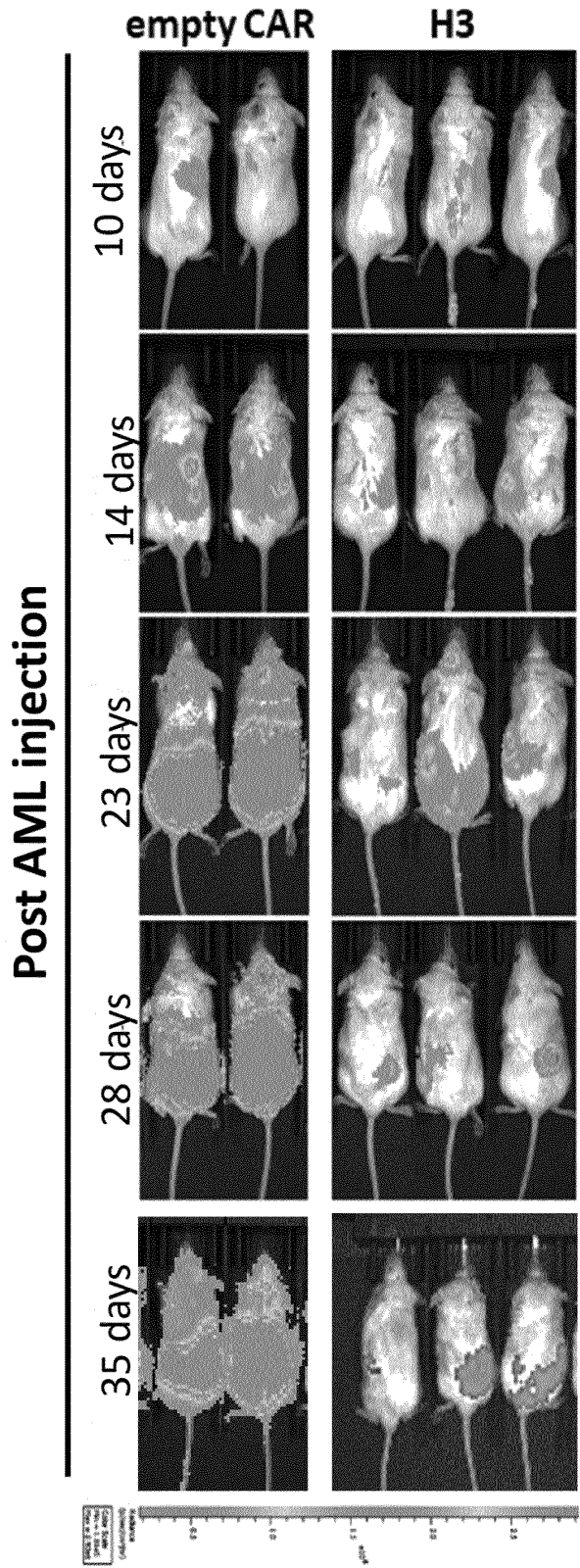


FIG. 26B

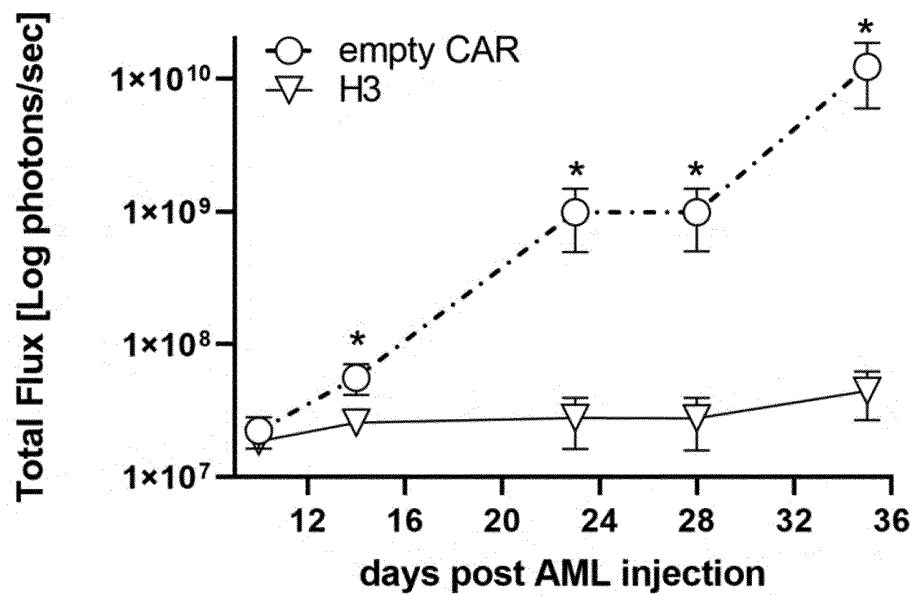


FIG. 26C

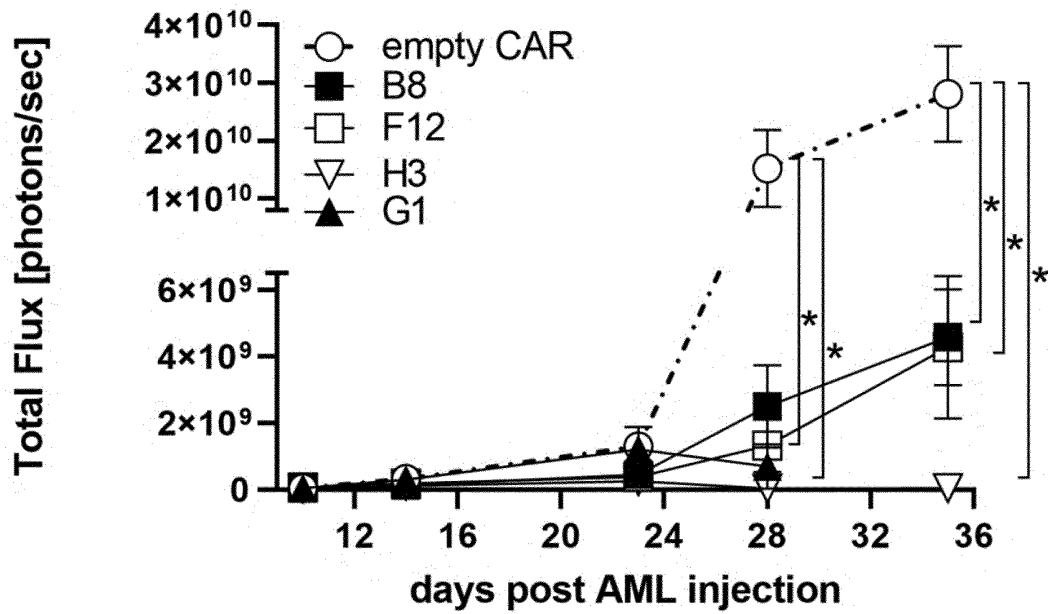


FIG 27

Gene Synthesis of optimized sequences for expression in Mammalian cells

SIP-scFv(14721-P1-A1)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgccaccATGAAGCACCTGTGGTTTTCTGCTGCTGGTGGCCGCCCCAGGTGGGTTCTGAGCCAGG
TGCAGCTGCAGCAGTCCGGCCCTGGCCTGGTGAGCCTAGCAGAACCCTGAGCCTGACATGTGCCATCAGCGGCCGA
TTCCATCTCCAGCAATACCGCCTCTGGAAGTGGATCAGACAGAGCCCTAGCAGGGGCTGGAGTGGGTGGGCAAG
ACAGAGTACAGATCCGGCTGGTTCTTCGAGTACGCCCCCTCGTGGGCGGCAGAGTGAATATCTCCCCGATACAA
GCAAGAACCAGTTCAGCCTGCAGCTGAATAGCGTGACACCTGAGGATACAGCCGTGTACTTCTGCGCCAGGGACTC
CTACAATGACTACGATAACGACGGCTTTGACATCTGGGGCCAGGGCACACTGGTGACAGTGAGCAGCGGCGGCGG
GGAAGCGGAGGAGGAGGATCTGGCGGCGGCGGTAGCGGAGGAGGTGGATCTCAGTCCGTGCTGACCCAGCCCCC
A GCGTGTCCGCTGCTCTGGACAGAAGGTGACCATCAGCTGCAGCGGCTCCTCTCCAATATCGGTCCAACACGT
GGCCTGGTACCAGCAGCTGCCGGCACAGCCCCAAGCTGCTGATCTACGACACCAACAAGAGGCCAGCGGCATC
CCCGATAGGTTTAGCGGCTCCAAGAGCGGCACATCCGCCACCCTGGGCATCACCAGGCTGCAGACAGGCGATGAGG
CCGACTACTACTGTGGCACATGGGACAGCTCCCTGAGCGCCGAGGTGTTGGGCACAGGCACAAAGGTGACCGTGCT
GATCGAGGTGATGTACCCCCCCCCCTACCTGGACAATGAGAAAGTCCAACGGCACAAATCATCCAGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTCCCGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCTGCTGGTGACAGTCGCCTTCATCATCTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTTATGAGGCCGTGCAGACAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG
GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCGACGCCCCGCCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGCAGGGACCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAACTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCAAGGtgagtcgac (SEQ ID NO: 24)

SIP-scFv(14721-P1-C1)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgccaccATGAAGCACCTGTGGTTTTCTGCTGCTGGTGGCCGCCCCCTAGATGGGTGCTGTCCCAGG
TGCAGCTGCAGCAGAGCGGCCCTGGCCTGGTGAAGCCCAGCCAGACCCTGTCCCTGACCTGCGCCATCAGCGGCCGA
TAGCGTGAGCAGCAACTCCGCCAGCTGGAATTGGATCAGGCAGTCCCCAGCAGGGGCTGGAGTGGCTGGGAAAG
ACAGAGTACAGATCCAAGTGGTACTACGAGTTGCCCTAGCGTGAAGAGCAGAATCACCATCACCCTGATACCA
GCAAGAACCAGTTTTCCCTGCAGCTGAATTCGTGACCCTGAGGACACCGCCGTGTACTACTGCGTGAGAGACTC
CTACAACGGCTACGATTTTGACGGCTTCGATATCTGGGGCCAGGGCACCCCTGGTGACCGTGTCCAGCGGCGGAGGC
GGAAGCGGAGGAGGAGGAAGCGGCGGAGGAGGCAGCGGAGGAGGTGGAAGCCAGAGCGTGTGACACAGCCCCC
TA GCGTGTCCGCCGCCCCAGGACAAAAGGTGACAATCAGCTGCTCCGCTCCTCTCCAATATCGGCAGCAACTACGT
GGCCTGGTACCAGCAGCTGCCTGGCACAGCCCCAAGCTGCTGATCTACGACACCAATAAGAGGCCCTCCGGCATC
CCCGATAGATTCTCCGGCTCCAAGAGCGGCACATCCGCCACCCTGGGCATCACCAGGCTGCAGACAGGCGATGAGG
CCGACTACTACTGTGGCACATGGGATTCTCCTGTCCGCCGAGGTGTTGGCACCGGCACAAAGGTGACCGTGCT
GATCGAGGTGATGTACCCCCCCCCCTACCTGGACAATGAGAAAGTCCAACGGCACAAATCATCCAGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTCCCGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCTGCTGGTGACAGTCGCCTTCATCATCTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTTATGAGGCCGTGCAGACAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG
GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCGACGCCCCGCCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGCAGGGACCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAACTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCAAGGtgagtcgac (SEQ ID NO: 25)

SIP-scFv(14721-P1-F1)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgccaccATGAAGCACCTGTGGTTCTTCTGCTGCTGGTGGCCGCCCCCTAGATGGGTGCTGAGCCAGG
TGCAGCTGCAGCAGTCCGGCCCTGGCCTGGTGAAGCCTTCCAGACACTGTCCCTGACATGTGCCATCAGCGGCCGA
CTCCGTGTTCTCCAATAGCGCCAGCTGGAATTGGATCAGACAGAGCCCTCCAGAGGCCTGGAGTGGCTGGGCAAG

ACAGAGTACAGGTCCAAGTGGTTTGACGAGTACGCCCCAGCGTGAAGGGCAGAATCGCCATCAGACCTGACACCT
CCAAGAACCAGGTGTCCCTGCAGCTGAATAGCGTGACCCCCGAGGACACCGCGTGTACTACTGTGTGAGAGATAG
CTACAACGGCTACGATTTTGATGGCTTTGACATCTGGGGCCAGGGCACCTGGTGACCGTGAGCTCCGGCGGAGGC
GGAAGCGGAGGAGGAGGAAGCGGCGGAGGCGGTAGCGGAGGAGGTGGAAGCCAGAGCGTGCTGACCCAGCCTCC
TAGCGTGAGCGCCGCCCTGGACAGCAGGTGATCATCTCCTGCAGCGGCTCCAGCTCCAACGTGGGCAATAACTACG
T GGCCTGGTACCAGCAGGTGCCCGCGCTGCTCCAGGCTGCTGATCTACGACAACTACAAGAGACCCTCCGGCATC
CCCGACAGGTTTTCCGGCAGCAAGTCCGGCACCTCCGCCACCCTGGGCATCACCGGACTGCAGAGCGGCGACGAGG
CCGACTACTACTGTGGCAGCTGGGATAGCTCCCTGAGCGCCGAGGTGTTTGGCGGCGGCACCAAGCTGACAGCCCT
GATCGAGGTGATGTACCCCCCCCCCTACCTGGACAATGAGAAGTCCAACGGCACAATCATCCACGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTTCCCGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCCTGCTGGTGACAGTCGCCTTCATCATCTTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTTATGAGGCCCGTGACAGAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG
GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCAGCCCCCGCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGCAGGGACCCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAACTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCCAAGGtgagtcgac (SEQ ID NO: 26)

SIP-scFv(14721-P1-G1)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgccaccATGAAGCACCTGTGGTTTTTCTGCTGCTGGTGGCCGCCCCAGGTGGGTCTGAGCCAGG
TGCAGCTGCAGCAGTCCGGCCCTGGCCTGGTGAAGCCCTCCAGACACTGAGCCTGACATGCGCCATCTCCGGCGA
CAGCGTGTTACAGCACCACCGCCAGCTGGAATTGGATCAGACAGAGCCCCAGCAGAGGCCTGGAGTGGCTGGGCAAG
ACCGAGTACAGGAGCAAGTGGTTCGACGAGTACGCCCCAGCGTGAAGGGCAGGATCGCCATCAGACCTGACACAT
CCAGAAATCAGGTGAGCCTGCAGCTGAATAGCATGACACCCGAGGATACCGCCGTGACTTCTGTGTGAGAGACAG
CTACAACGGCTACGACTTCGACGGCTTCGACATCTGGGGCCAGGGCACAACAGTGACAGTGAGCTCCGGCGGCGGC
GGCTCTGGAGGAGGAGGATCTGGCGGCGGCGGAAGCGGAGGAGGAGGTTCTCAGAGCGTGGTGACACAGCCCCC
A GCGTGAGCGCCGCTCCTGGACAAAAGGTGACCATCTCCTGCTCCGGCAGCAGCAGCAACATCGGCAATAACTACGT
GTCCTGGTACCAGCAGCTGCCTGGCACCGCCCCAAGCTGCTGATCTACGACAACAATAAGAGGCCAGCGGCATC
CCTGACAGATTCTCCGGCTCCAAGAGCGGCACCTCCGCCACCCTGGGCATCACAGGCCTGCAGACAGGCGACGAGG
CCGACTACTACTGTGGCAGATGGGATAGCTCCCTGTCCGCCGAGATGTTTGGCGGCGGCACCAAGGTGACCGTGCT
GATCGAGGTGATGTACCCCCCCCCCTACCTGGACAATGAGAAGTCCAACGGCACAATCATCCACGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTTCCCGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCCTGCTGGTGACAGTCGCCTTCATCATCTTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTTATGAGGCCCGTGACAGAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG
GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCAGCGCCCCCGCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGCAGGGACCCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAACTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCAAGGtgagtcgac (SEQ ID NO: 27)

SIP-scFv(14721-P1-C2)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgccaccATGAAGCACCTGTGGTTTTTCTGCTGCTGGTGGCCGCCCTAGGTGGGTGCTGAGCCAGG
TGCAGCTGCAGCAGAGCGGCCCTGGCCTGGTGAAGCCCAGCCAGACCCTGTCCCTGACATGCGCCATCAGCGGCGA
TAGCGTGTCCAGCAATAGCGCCTCCTGGAATTGGATCAGACAGAGCCCTAGCAGAGGCCTGGAGTGGCTGGGCAAG
GTGGAGTACAGGTCCAAGTGGTACGATGAGTACGCCCCCTCCGTGAAGAGCAGAATCGCCATCAGACCTGACACAT
CCAAGAACCAGGTGAGCCTGCACCTGATCTCCGTGACACCTGATGATACAGCCGTGTACTACTGCGCCAGGGACTC
CTACAACGGCCACGCCTTCGATGGCTTTGATGTGTGGGGCCAGGGCACAAGTGGTACCCTGTCCAGCGGCGGCGGC
GGATCTGGAGGAGGAGGAAGCGGCGGCGGAGGCTGTGGAGGAGGTGGAAGCCAGTCCGTGCTGACCCAGCCCCC
T CCGTGAGCGCTGCTCCAGGACAGAAGGTGACAATCAGCTGCTCCGGCTCCAGCTCCAACATCGGCGATAATCTGGT
GAGCTGGTACCAGCAGCTGCCTGGCACAGCCCCTAAGCTGCTGATCTACGATAACAATAAGAGACCCTCCGGCATC

CCCGACAGGTTGACGGCAGCAAGTCCGGCACCTCCGCCACACTGGACATCACAGGCCTGCAGACCGGCGACGAGG
CCGACTACTACTGCGAGAGCTGGGATAACAACCTGACCGCCGAGGTGTTGCGCACCGGCACAAAGGTGACAGTGCT
GATCGAGGTGATGTACCCCCCCCCCTACCTGGACAATGAGAAGTCCAACGGCACAATCATCCACGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTTCCCGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCCTGCTGGTGACAGTCGCCTTCATCATCTTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTATGAGGCCCGTGACAGACAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG
GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCGACGCCCCCGCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGCAGGGACCCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAACTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCAAGGtgagtcgac (SEQ ID NO: 28)

SIP-scFv(14721-P1-F2)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgccaccATGAAGCACCTGTGGTTCTTCTGCTGCTGGTGGCGCCCCCAGATGGGTGCTGTCCCAGG
TGACGCTGCAGCAGTCCGGCCCCGACTGGTGAAGCCTTCCAGACCCTGAGCCTGACCTGCGCCATCAGCGGCGA
CTCCGTGTTTAGCAACTCCGCCTCTGGAAGTGGATCAGACAGTCCCCCTCCAGAGGCCTGGAGTGGCTGGGCAAG
ACAGAGTACAGGAGCAAGTGGTTTGACGAGTACGCCCCCTCCGTGAAGGGCAGGATCGCCATCAGACCCGATACCT
CCAAGAATCAGGTGAGCCTGCAGCTGAATAGCGTGACACCCGAGGACACCGCCGTGTACTACTGTGTGAGAGACTC
CTACAATGGCTACGACTTCGACGGCTTTGACATCTGGGGCCAGGGCACCTGGTGACCGTGTCCAGCGGCGGAGGC
GGAAGCGGAGGAGGAGGAAGCGGCGGAGGAGGCTCCGGAGGAGGAGGTTCCAGAGCGTGCTGACCCAGCCCCCT
AGCGTGAGCGCCGCTCTGGACAGAAGGTGACCATCAGTGCTCCGGCGGCTCCAGCAACATCGAGAAGAACTACGT
GAGCTGGTACCAGCAGCTGCCTGGCACAGCCCCCTAAGCTGCTGATCTACGACACCAATAAGAGGCCTAGCGGCATC
CCCGACAGATTGACGGCTCCAAGTCCGGCACAAAGCGCCACACTGGGCATCACCGGCCTGCAGACCGGCGACGAGG
CCGATTACTACTGTGGCGCTGGGATAATATCTGAAGTCCGAGATGTTGCGCGGCGGCACAAAGCTGACAGTGCT
GATCGAGGTGATGTACCCCCCCCCCTACCTGGACAATGAGAAGTCCAACGGCACAATCATCCACGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTTCCCGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCCTGCTGGTGACAGTCGCCTTCATCATCTTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTATGAGGCCCGTGACAGACAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG
GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCGACGCCCCCGCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGCAGGGACCCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAACTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCAAGGtgagtcgac (SEQ ID NO: 29)

SIP-scFv(14721-P1-H2)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgccaccATGAAGCACCTGTGGTTCTTCTGCTGCTGGTGGCGCCCCCAGATGGGTGCTGAGCCAGG
TGACGCTGCAGCAGAGCGGCCCTGGCCTGGTGAAGCCTTCCAGACACTGAGCCTGACCTGTGCCATCAGCGGCGA
TAGCGTGTTTAGCAACAGCGCCAGCTGGAATTGGATCAGGCAGAGCCCTCCAGGGGCCTGGAGTGGCTGGGCAAG
ACCGAGTACAGGTCCAAGTGGTTCGATGAGTACGCCCTAGCGTGAAGGGCAGGATCGCCATCAGGCCTGACACCT
CCAAGAACCAGGTGTCCCTGCAGCTGAATCCGTGACACCTGAGGATACCGCCGTGTACTACTGCGTGAGGGATT
CTACAACGGCTACGACTTCGACGGCTTTGATATCTGGGGCCAGGGCACACTGGTGACAGTGTCTCCGGCGGCGGC
GGAAGCGGAGGAGGAGGATCTGGCGGCGGCGGTTCCGGAGGAGGAGGTTCTAGTCCGTGGTGACCCAGCCTCCC
A GCGTGAGCGCCGCTCCTGGACAGAAGGTGACCATCAGCTGTAGCGGCAGCTCCTCAACATCGGCAACAACACTACGT
GTCCTGGTACCAGCAGCTGCCCGGCACCGCCCCAAAGCTGCTGATCTACGATAATAATAAGAGACCTTCCGGCATC
CCCGATAGATTTTCCGGCAGCAAGAGCGGCACAAGCGCCACCCTGGGCATCACAGGCCTGCAGACCGGCGACGAGG
CCGATTACTACTGCGGCACCTGGGATAGCAGCCTGTCCGCCGAGGTGTTTGGCGGCGGCACCAAGCTGACCGTGCT
GATCGAGGTGATGTACCCCCCCCCCTACCTGGACAATGAGAAGTCCAACGGCACAATCATCCACGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTTCCCGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCCTGCTGGTGACAGTCGCCTTCATCATCTTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTATGAGGCCCGTGACAGACAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG

FIG 27 continued

GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCGACGCCCCGCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGCAGGGACCCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAACTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCAAGGtgagtcgac (SEQ ID NO: 30)

SIP-scFv(14721-P1-H3)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgccaccATGAAGCACCTGTGGTTTTCTGCTGCTGGTGGCCGCCCCAGGTGGGTCTGTCCCAGG
TGCAGCTGCAGCAGAGCGGCCCGGACTGGTGAAGCCCAGCCAGACACTGAGCCTGACATGTGACATCTCCGGCGA
TTCCGTGTTCTCCAACACAGCCAGCTGGAATTGGATCAGGCAGAGCCCCAGCAGGGGCCTGGAGTGGCTGGGAAAG
ACAGAGTACAGATCCCAGTGGCTGCACGAGTACGCCCTTCCGTGAGATCCAGGATCGCCATCAGACCCGACACCT
CCAAGAACCAGGTGTCCCTGCAGCTGTCTTCGTGACCCCGAGGACACCGCCGTGTACTACTGTGTGAGGGATTCT
CTACAATGGCTACGCCTTCGATGGCTTTGACACCTGGGGCCAGGGCACCCCTGGTGACCGTGAGCAGCGGCGGAGGC
GGAAGCGGAGGAGGAGGAAGCGGCGGAGGAGGCTCCGGAGGAGGAGGTAGCCAGAGCGTGGTGACCCAGCCCCC
CA GCGTGTCCGCTGCTCCTGGACAGAAGGTGACCATCAGCTGTTCCGGCAGGAACTCCAACATCGCCAACAACCTTGT
GTCCTGGTACAGACAGCTGCCTGGCACCGCCCCTAAGCTGCTGATCTACGACAATAATAAGAGGCCTAGCGGCATC
CCCGATAGATTCTCCGGCTCCAAGAGCGGCACATCCGCCACCTGGCCATCACCGGCCTGCAGACCGGCGACGAGG
CCGATTACTACTGCGAGTCTGGGATAGCTCCCTGACCGCCGAGGTGTTTGGCACCGGCACCAAGGTGACCGTGCT
GATCGAGGTGATGTACCCCCCCCCTACCTGGACAATGAGAAGTCCAACGGCACAATCATCCACGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTTCCGGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCCTGCTGGTGACAGTCGCCTTCATCATCTTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTATGAGGCCGTGCAGACAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG
GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCGACGCCCCGCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGCAGGGACCCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAACTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCAAGGtgagtcgac (SEQ ID NO: 31)

SIP-scFv(14722-P1-F12)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgccaccATGAAGCACCTGTGGTTCTTCTGCTGCTGGTGGCCGCCCCCTAGGTGGGTGCTGAGCCAGG
TGCAGCTGCAGCAGTCCGGCCCTGGCCTGGTGAAGCCCAGCCAGACACTGAGCCTGACCTGTGCCATCTCCGGCGA
CTCCGTGTCCAGCAACAGCGCCTCCTGGAAGTGGATCAGACAGTCCCCTAGCAGGGGCCTGGAGTGGCTGGGCAAG
GTGGAGTACAGATCCAAGTGGTACGATGAGTACGCCCCAGCGTGAAGAGCAGAATCGCCATCAGACCTGACACCA
GCAAGAACCAGGTGTCCCTGCACCTGATCAGCGTGACCCCTGATGACACAGCCGTGTACTACTGCGCCAGAGATAG
CTACAACGGCCACGCCTTTGATGGCTTTGATGTGTGGGGCCAGGGCACAATGGTGACCGTGAGCTCCGGCGGCGGC
GGATCTGGAGGAGGAGGAAGCGGCGGCGGCGGTTCTGGAGGAGGTGGAAGCCAGAGCGTGGTGACACAGCCTCCC
T CCGTGTCCGCCGCCCTGGACAAAAGGTGACCATCTCTGCAGCGGCAGCAGCAACATCGGCAATAACTACGT
GTCCTGGTACCAGCAGCTGCCTGGCACAGCCCCAAGCTGCTGATCTACGACAACAATAAGAGGCCAGCGGCATC
CCCGACAGGTTCTCCGGCTCCAAGTCCGGCACCTCCGCCACACTGGGCATCACAGGCCTGCAGACCGGCGACGAGG
CCGACTACTACTGTGGCACCTGGGATTCCAGCCTGAGCGCCGAGGTGTTTGGCGGCGGCACAAAGGTGACAGTGCT
GATCGAGGTGATGTACCCCCCCCCTACCTGGACAATGAGAAGTCCAACGGCACAATCATCCACGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTTCCGGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCCTGCTGGTGACAGTCGCCTTCATCATCTTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTATGAGGCCGTGCAGACAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG
GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCGACGCCCCGCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGCAGGGACCCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAACTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCAAGGtgagtcgac (SEQ ID NO: 32)

FIG 27 continued

SIP-scFv(14722-P2-B8)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgcccaccATGAAGCACCTGTGGTTTTTCTGCTGCTGGTGGCCGCCCCAGATGGGTGCTGAGCCAGG
TGCAGCTGCAGCAGTCCGGCCCTGGCCTGGTGAAGCCTTCCCAGACACTGTCCCTGACCTGCGCCATCAGCGGCGA
CAGCGTGAGCAGCAATTCGCCAGCTGGAAGTGGATCAGGCAGTCCCCAGCAGGGGCCTGGAGTGGCTGGGAAAG
GTGGAGTACAGGAGCAAGTGGTACGACGAGTACGCCCCAGCGTGAAGAGCAGAATCGCCATCAGGCCCCACACAT
CCAAGAATCAGGTGAGCCTGCACCTGATCAGCGTGACCCCCGATGACACAGCCGTGTACTACTGCGCCAGAGACTC
CTACAACGGCCACGCCTTCGACGGCTTTGACGTGTGGGGCCAGGGCACAATGGTGACAGTGAGCTCCGGCGGGCGG
GGCTCTGGAGGAGGAGGATCTGGCGGGCGGGAAGCGGAGGAGGAGGTTCTCAGAGCGTGCTGACCCAGCCCCCT
A GCCTGAGCGCCGCTCCTGGACAGAGAGTGACCATCAGCTGCTCCGGCACAACCTCCAATATCGCCAATAATTTCTG
GTCCTGGTACCAGCAGCTGTCCGGCTCCGCCCCCAAGCTGCTGATCAATGACAATAACAAGAGACCCCTCCGGCATC
CCCGATAGGTTCTCCGGCAGCAAGTCCGGCGCCTCCGCCACACTGGCCATCACCGGACTGCAGACAGAGGACGAGG
CCGACTACTACTGTGGCGTGTGGGACAACAGCCTGAATGCCGAGGTGTTTGGCGGGCGGACCAAGGTGACCGTGCT
GATCGAGGTGATGTACCCCCCCCCTACCTGGACAATGAGAAGTCCAACGGCACAATCATCCACGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTTCCGGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCCTGCTGGTGACAGTCGCCTTCATCATCTTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTTATGAGGCCCGTGACAGACAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG
GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCGACGCCCCCGCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGACAGGGACCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAAGTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCAAGGtgagtcgac (SEQ ID NO: 33)

SIP-scFv(14722-P2-B11)-hCD28hinge-hCD28TMD-4IBB-CD3zeta cDNA – 1 506bp
ggatccgccgcccaccATGAAGCACCTGTGGTTTTTCTGCTGCTGGTGGCCGCCCTAGGTGGGTGCTGTCCCAGG
TGCAGCTGCAGCAGTCCGGCCCCGGACTGGTGAAGCCTTCCCAGACCCTGAGCCTGACATGTGCCATCTCCGGCGA
CAGCGTGTCTCCAACCTCCGCCAGCTGGAAGTGGATCAGGCAGTCCCCCTCCAGAGGCCTGGAGTGGCTGGGCAAG
ACAGAGTACAGAAGCAAGTGGTACTACGAGTTTGCCCTAGCGTGAAGTCCAGAATCACCATCACCCCGACACCA
GCAAGAATCAGTTTAGCCTGCAGCTGAATAGCGTGACCCCTGAGGATACAGCCGTGTACTACTGCGTGAGGGATAG
CTACAACGGCTACGACTTCGACGGCTTTGATATCTGGGGCCAGGGCACACTGGTGACCGTGTCAGCGGCGGCGGC
GGATCTGGAGGAGGAGGAAGCGGCGGCGGAGGCTCTGGAGGAGGTGGAAGCCAGAGCGTGCTGACCCAGCCCCCT
A GCGTGAGCGCCGCTCCTGGACAGAAGGTGACAATCAGCTGCTCCGGCTCCAGCAGCAACATCGGCAGCAATTACGT
GGCCTGGTACCAGCAGCTGCCTGGCACCGCCCCCAAGCTGCTGATCTACGACACAAACAAGAGGCCAGCGGCATC
CCTGACAGGTTTCAGCGGCAGCAAGAGCGGCACCCAGCGCCACCTGGGCATCACCGGACTGCAGACAGGCGACGAGG
CCGATTACTACTGTGGCACCTGGGACTCCAGCCTGAGCGCCGAGGTGTTTGGCACAGGCACAAAGGTGACCGTGCT
GATCGAGGTGATGTACCCCCCCCCTACCTGGACAATGAGAAGTCCAACGGCACAATCATCCACGTGAAGGGCAAG
CACCTGTGTCCAGCCCCCTGTTTCCGGGCCCTAGCAAGCCCTTCTGGGTGCTGGTGGTGGTGGGCGGCGTGCTGG
CTTGTTACAGCCTGCTGGTGACAGTCGCCTTCATCATCTTTTGGGTGAAGAGGGGCAGGAAGAAGCTGCTGTACAT
CTTTAAGCAGCCCTTTATGAGGCCCGTGACAGACAACCCAGGAGGAGGACGGCTGTAGCTGCAGGTTTCTGAGGAG
GAGGAGGGCGGCTGTGAGCTGAGAGTGAAGTTCAGCAGGTCCGCCGACGCCCCCGCTACCAACAGGGACAGAATC
AGCTGTACAATGAGCTGAACCTGGGCAGAAGAGAGGAGTACGACGTGCTGGATAAGAGGAGAGGACAGGGACCTG
AGATGGGCGGCAAGCCTAGAAGAAAGAACCCCCAGGAGGGCCTGTACAATGAAGTGCAGAAGGACAAGATGGCCG
AGGCCTACAGCGAGATCGGCATGAAGGGCGAGAGAAGGAGGGGCAAGGGCCACGATGGCCTGTACCAGGGCCTGT
CCA CAGCCACCAAGGACACATACGACGCCCTGCACATGCAGGCCCTGCCCCAAGGtgagtcgac (SEQ ID NO: 34)

3. Expected protein sequence

SIP-scFv(14721-P1-A1)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=53.75kDa

FIG 27 continued

MKHLWFFLLVAAAPRWVLSQVQLQQSGPGLVQPSRTLSLTCAISGDSISSNTASWNWIRQSPSRGLEWVGKTEYRS
GWFFEYAPSVGGRVNISPDTSKNQFSLQLNSVTPEDTAVYFCARDSYNDYDNDGFDIWGQGTTLTVSSGGGGSGGG
GSGGGGSGGGGSQSVLTQPPSVSAAPGQKVTISCSGSSSNIGSNYVAWYQQLPGTAPKLLIYDNRKPSGIPDRFS
GSKSGTSATLGITGLQTGDEADYYCGTWSSLSAEVFGTGKTVLIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVLVVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDYDALHMQALPPR (SEQ ID NO: 35)

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]

> SIP-scFv(14721-P1-C1)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=53.93kDa

MKHLWFFLLVAAAPRWVLSQVQLQQSGPGLVKPSQTLSTCAISGDSVSSNSASWNWIRQSPSRGLEWLGKTEYRS
KWWYEFAPSVKSRITITPDTSKNQFSLQLNSVTPEDTAVYYCVRDSYNGYDFDGFDIWGQGTTLTVSSGGGGSGGG
GSGGGGSGGGGSQSVLTQPPSVSAAPGQKVTISCSGSSSNIGSNYVAWYQQLPGTAPKLLIYDNRKPSGIPDRFS
GSKSGTSATLGITGLQTGDEADYYCGTWSSLSAEVFGTGKTVLIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVLVVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDYDALHMQALPPR (SEQ ID NO: 36)

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]

> SIP-scFv(14721-P1-F1)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=53.87kDa

MKHLWFFLLVAAAPRWVLSQVQLQQSGPGLVKPSQTLSTCAISGDSVFSNSASWNWIRQSPSRGLEWLGKTEYRS
KWFDEYAPSVKGRIAIRPDTSKNQVSLQLNSVTPEDTAVYYCVRDSYNGYDFDGFDIWGQGTTLTVSSGGGGSGGG
GSGGGGSGGGGSQSVLTQPPSVSAAPGQVVIISCSGSSSNVGNVVAWYQQVPGAAPRLIYDNYKRPSGIPDRFS
GSKSGTSATLGITGLQSGDEADYYCGSWSSLSAEVFGGKTALIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVLVVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDYDALHMQALPPR (SEQ ID NO: 37)

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]

> SIP-scFv(14721-P1-G1)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=53.95kDa

MKHLWFFLLVAAAPRWVLSQVQLQQSGPGLVKPSQTLSTCAISGDSVFSTASWNWIRQSPSRGLEWLGKTEYRS
KWFDEYAPSVKGRIAIRPDTSRNQVSLQLNSMTPEdTAVYFCVRDSYNGYDFDGFDIWGQGTTLTVSSGGGGSGGG
GSGGGGSGGGGSQSVVTQPPSVSAAPGQKVTISCSGSSSNIGNVYVSWYQQLPGTAPKLLIYDNNKPSGIPDRFS
GSKSGTSATLGITGLQTGDEADYYCGTWSSLSAEMFGGKTGTVLIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVLVVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDYDALHMQALPPR (SEQ ID NO: 38)

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]

> SIP-scFv(14721-P1-C2)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=53.94kDa

MKHLWFFLLVAAAPRWVLSQVQLQQSGPGLVKPSQTLSTCAISGDSVSSNSASWNWIRQSPSRGLEWLGKVEYRS
KWWYEFAPSVKSRIAIRPDTSKNQVSLHLISVTPDDTAVYYCARDSYNGHAFDGFVWGQGTTLTVSSGGGGSGGG
GSGGGGSGGGGSQSVLTQPPSVSAAPGQKVTISCSGSSSNIGDNLVSWYQQLPGTAPKLLIYDNNKPSGIPDRFS

FIG 27 continued

GSKSGTSATLDITGLQTGDEADYYCESWDNNLTAIEVFGTGKTVLIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVLVVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDKRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDTYDALHMQALPPR (SEQ ID NO: 39)

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]

> SIP-scFv(14721-P1-F2)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=54.06kDa
MKHLWFFLLVAAPRWVLSQVQLQQSGPGLVKPSQTLSTCAISGDSVFSNSASWNWIRQSPSRGLEWLKGTEYRS
KWFDEYAPSVKGRIAIRPDTSKNQVSLQLNSVTPEDTAVYYCVRDSYNGYDFDGFDIWGQGLTVTVSSGGGGSGGG
GSGGGGSGGGGSQSVLTQPPSVSAAPGQKVTISCSGSSNIEKNYVSWYQQLPGTAPKLLIYDNRKPSGIPDRFS
GSKSGTSATLGITGLQTGDEADYYCGAWDNILNSEMFGGGKTLTVLIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVLVVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDKRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDTYDALHMQALPPR (SEQ ID NO: 40)

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]

> SIP-scFv(14721-P1-H2)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=53.90kDa
MKHLWFFLLVAAPRWVLSQVQLQQSGPGLVKPSQTLSTCAISGDSVFSNSASWNWIRQSPSRGLEWLKGTEYRS
KWFDEYAPSVKGRIAIRPDTSKNQVSLQLNSVTPEDTAVYYCVRDSYNGYDFDGFDIWGQGLTVTVSSGGGGSGGG
GSGGGGSGGGGSQSVVTQPPSVSAAPGQKVTISCSGSSNIGNNNYVSWYQQLPGTAPKLLIYDNNRPSGIPDRFS
GSKSGTSATLGITGLQTGDEADYYCGTWSSLSAEVFGGKTLTVLIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVLVVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDKRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDTYDALHMQALPPR (SEQ ID NO: 41)

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]

> SIP-scFv(14721-P1-H3)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=54.22kDa
MKHLWFFLLVAAPRWVLSQVQLQQSGPGLVKPSQTLSTCDISGDSVFSNTASWNWIRQSPSRGLEWLKGTEYRS
QWLHEYAPSVRSRIAIRPDTSKNQVSLQLSFVTPEDTAVYYCVRDSYNGYAFDGFDTWGQGLTVTVSSGGGGSGGG
GSGGGGSGGGGSQSVVTQPPSVSAAPGQKVTISCSGRNSNIANNFVSWYRQLPGTAPKLLIYDNNRPSGIPDRFS
GSKSGTSATLAITGLQTGDEADYYCESWDSSSLAEVFGTGKTVLIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVLVVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDKRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDTYDALHMQALPPR (SEQ ID NO: 42)

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]

> SIP-scFv(14722-P1-F12)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=53.77kDa
MKHLWFFLLVAAPRWVLSQVQLQQSGPGLVKPSQTLSTCAISGDSVSSNSASWNWIRQSPSRGLEWLKGVEYRS
KWYDEYAPSVKSRIAIRPDTSKNQVSLHLISVTPDDTAVYYCARDYNGHAFDGFVDVWGQGTMTVTVSSGGGGSGGG
GSGGGGSGGGGSQSVVTQPPSVSAAPGQKVTISCSGSSNIGNNNYVSWYQQLPGTAPKLLIYDNNRPSGIPDRFS
GSKSGTSATLGITGLQTGDEADYYCGTWSSLSAEVFGGKTVLIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVLVVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDKRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDTYDALHMQALPPR (SEQ ID NO: 43)

FIG 27 continued

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]

> SIP-scFv(14722-P2-B8)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=53.89kDa
MKHLWFFLLLVAAPRWVLSQVQLQQSGPGLVKPSQTLSTCAISGDSVSSNSASWNWIRQSPSRGLEWLGKVEYRS
KWYDEYAPSVKSRIAIRPDTSKNQVSLHLISVTPDDTAVYYCARDSEYNGHAFDGFDFVWGQGTMTVSSGGGGSGGG
GSGGGGSGGGGSQSVLTQPPSLAAPGQRTISCSGTTSNIANNFVSWYQQLSGSAPKLLINDNNKRPSGIPDRFS
GSKSGASATLAITGLQTEADYYCGVWDNSLNAEVFGGGTKVTVLIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVVLVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDKRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDTYDALHMQALPPR (SEQ ID NO: 44)

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]

> SIP-scFv(14722-P2-B11)-hCD28hinge-hCD28TMD-4IBB-CD3zeta – 494AAs MW=53.93kDa
MKHLWFFLLLVAAPRWVLSQVQLQQSGPGLVKPSQTLSTCAISGDSVSSNSASWNWIRQSPSRGLEWLGKTEYRS
KWYEFAPSVKSRIITPDTSKNQFSLQLNSVTPEDTAVYYCVRDSYNGYDFDGFDFWGGQTLTVSSGGGGSGGG
GSGGGGSGGGGSQSVLTQPPSVSAAPGQKVTISCSGSSNIGSNYVAWYQQLPGTAPKLLIYDTNKRPSGIPDRFS
GSKSGTSATLGITGLQTGDEADYYCGTWDSSLSAEVFGTGKVTVLIEVMYPPPYLDNEKSNGTIIHVKGKHLCP
PLFPGPSKPFWVVLVVGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGC
ELRVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDKRRGRDPEMGGKPRRKNPQEGLYNELQDKMAEAYSEI
GMKGERRRGKGGHDGLYQGLSTATKDTYDALHMQALPPR (SEQ ID NO: 36)

Features : SIP : [1 : 19] scFv : [20 : 274] hCD28hinge-hCD28TMD-4IBB-CD3zeta : [275 : 494]